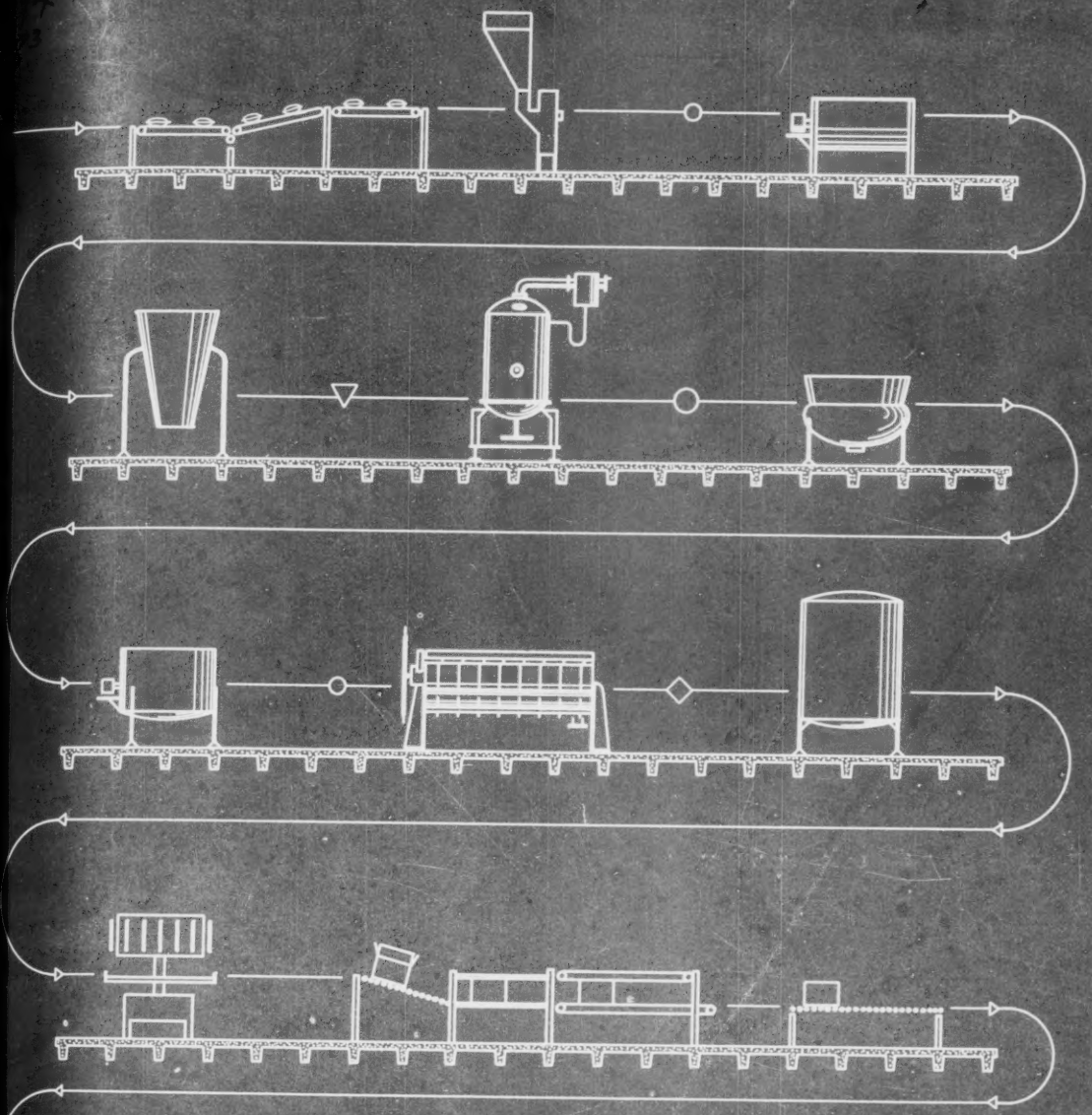


MODERNIZATION ISSUE

GENERAL LIBRARY
SEP 14 1954
UNIVERSITY OF GEORGIA

DRUG & COSMETIC INDUSTRY

MARCH 1941

Send for your sample of SNOW TOP Precipitated Chalk and prove to yourself its superior qualities. If you manufacture dentifrices, pharmaceuticals, anti-acid tablets or cosmetics, one of our five standard grades should suit your purpose, or we can manufacture to your specifications.

Specification Ranges for Snow Top

Grade	Rattle cc	Flow cc	2-hour cc	Final cc	Packing Density g/cc	Packing Density lbs/ft³
Super Light	30-45	40-60	90-58	70-50	0.300-.400	18.7-25.0
Light	23-26	27-32	50-40	40-35	0.475-.550	29.6-34.3
Medium	17-23	19-27	40-25	35-24	0.550-.675	34.3-42.1
Heavy	15-17	15-19	25-20	24-19	0.675-.800	42.1-49.9
Extra Heavy	11-15	11-15	20-15	19-15	0.800-.950	49.9-59.3

Write to our nearest office for your sample of

Snow Top

PRECIPITATED CHALK

INDUSTRIAL CHEMICAL SALES

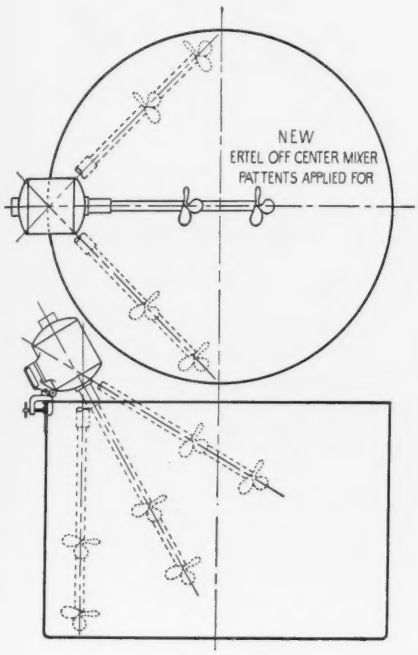
DIVISION WEST VIRGINIA PULP AND PAPER COMPANY

NEW YORK	CHICAGO	PHILADELPHIA	CLEVELAND
230 Park Avenue	35 E. Wacker Drive	748 Public Ledger Bldg.	417 Schofield Bldg.

ERTEL LIQUID HANDLING *Equipment*

fits the plan of factory modernization like a glove

Illustration of an S. J. Model Swivel Joint Mixer.



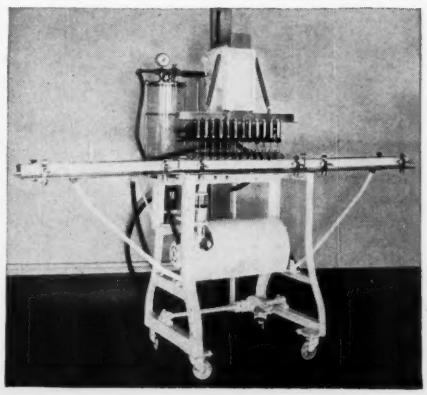
It's MODERN... EFFICIENT... DURABLE...

It's designed to achieve maximum results with the least expenditure of effort and space. It's as permanent and dependable in service as skill and fine materials can make it.

The Ertel Engineering Corp., keeping abreast of the times, has developed a new swivel joint design for portable mixing equipment which we believe is superior to any now on the market.

This new, patent applied for design makes it easily possible not only to adjust the mixer to any vertical angle but to any horizontal plane as well. Incorporated in this universal adjustable feature is a safety factor which prevents the mixing unit from slipping during adjustment of the angle thus avoiding damage to glass lined tanks, etc. A special horizontal bearing surface makes it impossible for the mixing unit to drop out of vertical alignment even though the adjustment be made while the mixer is in operation.

The direct drive and back geared models of these swivel joint mixers are illustrated and the line drawing clearly shows the multiplicity of mixing angles possible with these new Ertel swivel joint mixers.

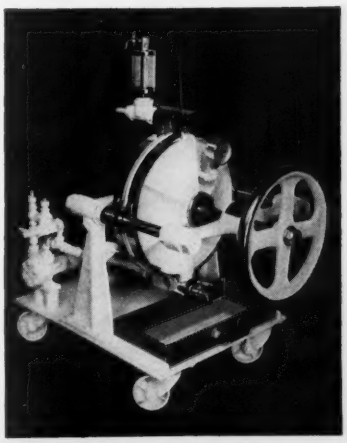


ERTEL "EMSA" VACUUM BOTTLE FILLER
For Small Bottles

•

ERTEL EBW BENCH MODEL FILTER

This portable unit is equipped with a 3 gpm pump and accommodates from two to six Ertel asbestos filter disks. The hand wheel method of tightening saves time and effort.



ERTEL ENGINEERING CORPORATION
EXECUTIVE OFFICES AND FACTORY: 44 MILL STREET · KINGSTON, N. Y.
SALES OFFICE AND SHOWROOM: 40 WEST 48TH STREET · NEW YORK, N. Y.

Drug & Cosmetic INDUSTRY

MARCH 1941

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Modernization Issue

Because of the intense interest in plant modernization in this industry, we have turned this issue over to Francis Chilson, our Production Editor. Acting as Guest Editor of this issue, Mr. Chilson has obtained ten articles of vital interest to all in this industry who are in anyway interested in production problems.

Front Cover

The front cover, which represents a typical production line for the products of this industry, was designed and executed by Arthur Meggett, Industrial designer.

The Drug and Cosmetic Industry is published monthly by Drug Markets, Inc., Frazer V. Sinclair, President and Treasurer; Thomas R. Farrell, Vice-president and Secretary. Publication Address, 28 Renne Ave., Pittsfield, Mass., U. S. A. Editorial and General Office, 101 West 31st St., New York, N. Y., U. S. A.

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NEW ENGLAND *Moves Fast* WHEN YOU NEED GOOD TUBES IN A HURRY!

STREAMLINED for speed in the production of fine collapsible tubes, New England is your *dependable* source of supply! All the development work achieved in 88 years of research . . . the unusual skill and experience of highly trained craftsmen . . . the amazing efficiency of intricate methods and machinery . . . all are geared to produce tubes of outstanding beauty and strength, at no higher cost. Learn more about our exclusive metal toughening SHEFFIELD PROCESS; VINICOTE interior coatings; clay coated tube cartons; and the many other superior advantages of New England Tube service. Just write or phone our nearest office. See what we mean by ACTION!

New England
SHEFFIELD PROCESS
TUBES

● WHAT IS THE "SHEFFIELD PROCESS"?

The "Sheffield Process" is an exclusive method of mixing, melting, and tempering tube metals, developed and highly perfected by our own research staff. It creates a degree of pliable strength and toughness in New England Tubes which we believe is unapproached by any other collapsible tube in the world!

NEW ENGLAND COLLAPSIBLE TUBE CO.

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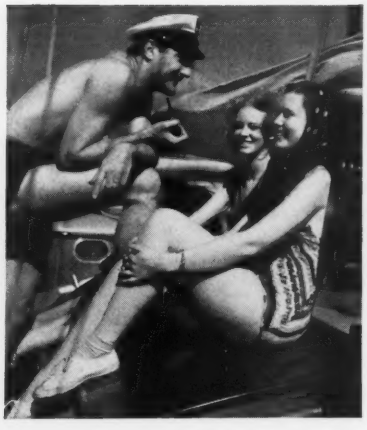
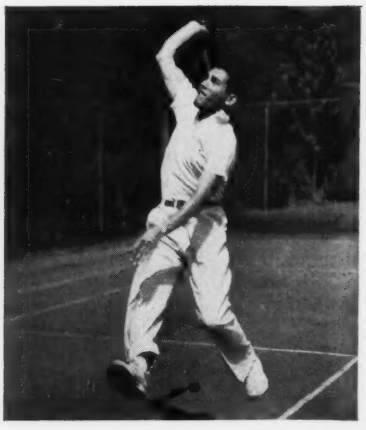
EXPORT DIVISION: 116 NASSAU STREET, NEW YORK, U.S.A.





Filter the Summer Sun

WITH

MENTHYL SALICYLATE MERCK

In the manufacture of your suntan preparations, it will pay you to use a reliable sun-screen filter. Upon this *important ingredient* depends the safety and efficiency of your product — and steady repeat purchases by satisfied customers.

MENTHYL SALICYLATE MERCK

effectively obscures better than 95% of the ultra-violet rays between 2900-3100 Angstrom units (considered to be rays that burn and blister). You can depend upon it for building a "name call" for your product.

Also available for use in the manufacture of suntan and sunburn preparations are many other materials under the Merck label. Some may be used as essential parts of products recommended for relief of sunburn, others may be used in preparations that completely "block out" the sun's rays for effective prevention of burning and tanning.

Merck & Co. Inc. has been a pioneer in the promotion of specialized materials for protection against the sun. We gladly offer our services in the successful incorporation of these products in your suntan and sunburn preparations.

WRITE FOR QUOTATIONS AND SAMPLES

MERCK

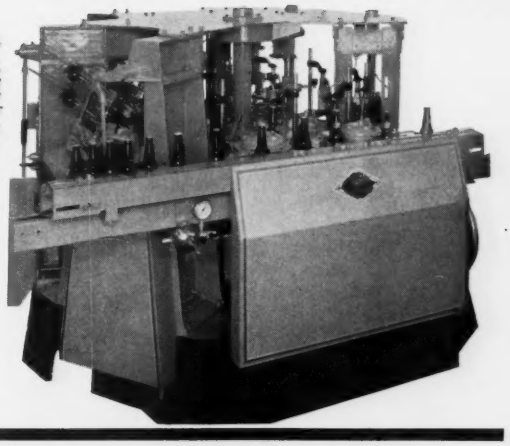
MERCK

FINE CHEMICALS FOR THE PROFESSIONS AND INDUSTRY SINCE

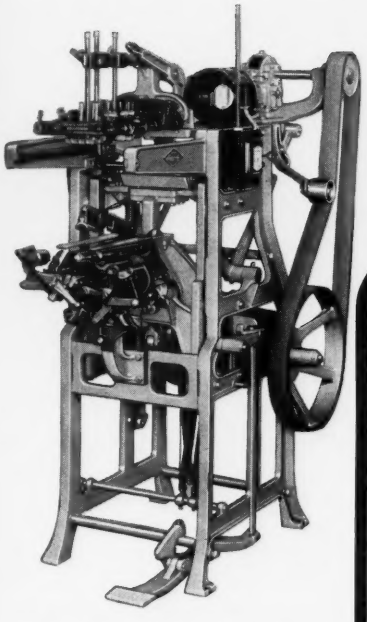
★ 1818 ★

MERCK & CO. Inc. *Manufacturing Chemists* RAHWAY, N. J.

New York • Philadelphia • St. Louis • *In Canada:* Merck & Co. Ltd., Montreal and Toronto



The Liquid Triplex Labeler offers a new high in production capacity. Completely automatic. Three sets of label holders and pickers. Twelve labeling heads. New style high speed worm feed and discharge mechanism. Exclusive Liquid principle of labeling assures accurate placing of labels, high speed production with freedom from delays—and labeling costs are cut to the bone.



The Liquid Standard Labeler is a semi-automatic, hand-fed machine. Will label practically any size container with body label; or body and neck; or (if equipped with foiling attachment) body, neck and foil. Floor space, 10 square feet. Capacity, up to 40 bottles per minute. A similar model is the Liquid "Midget" labeler, remarkable for its ability to handle small size containers.

Year after Year . . . .

the labeling jobs of one or more of these "Liquid" labeling machines, wins in All-American packaging competition.

Liquid labeling equipment assures uniformity and perfection of label application, plus the continuous trouble-free speed so necessary to economical production.

The Liquid line includes a machine for every standard requirement of labeling, regardless of size or style of container or production capacity —plus specially designed machines adapted to handling unusual labeling requirements.

The Liquid catalog of Labeling machinery explains them individually, pictures their accomplishments for many leading merchandisers. Your letter will bring a copy to your desk.

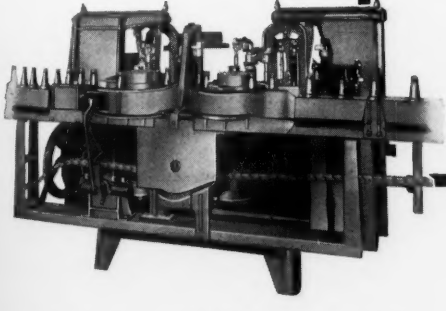
THE LIQUID CARBONIC CORPORATION

3110 S. Kedzie Avenue, Chicago, Ill.

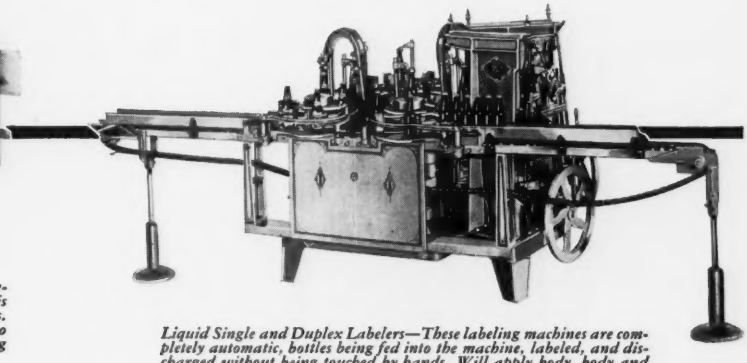
Branches in 37 Principal Cities of the United States and Canada

London, England — Havana, Cuba

Manufactured in Montreal for the Canadian Trade

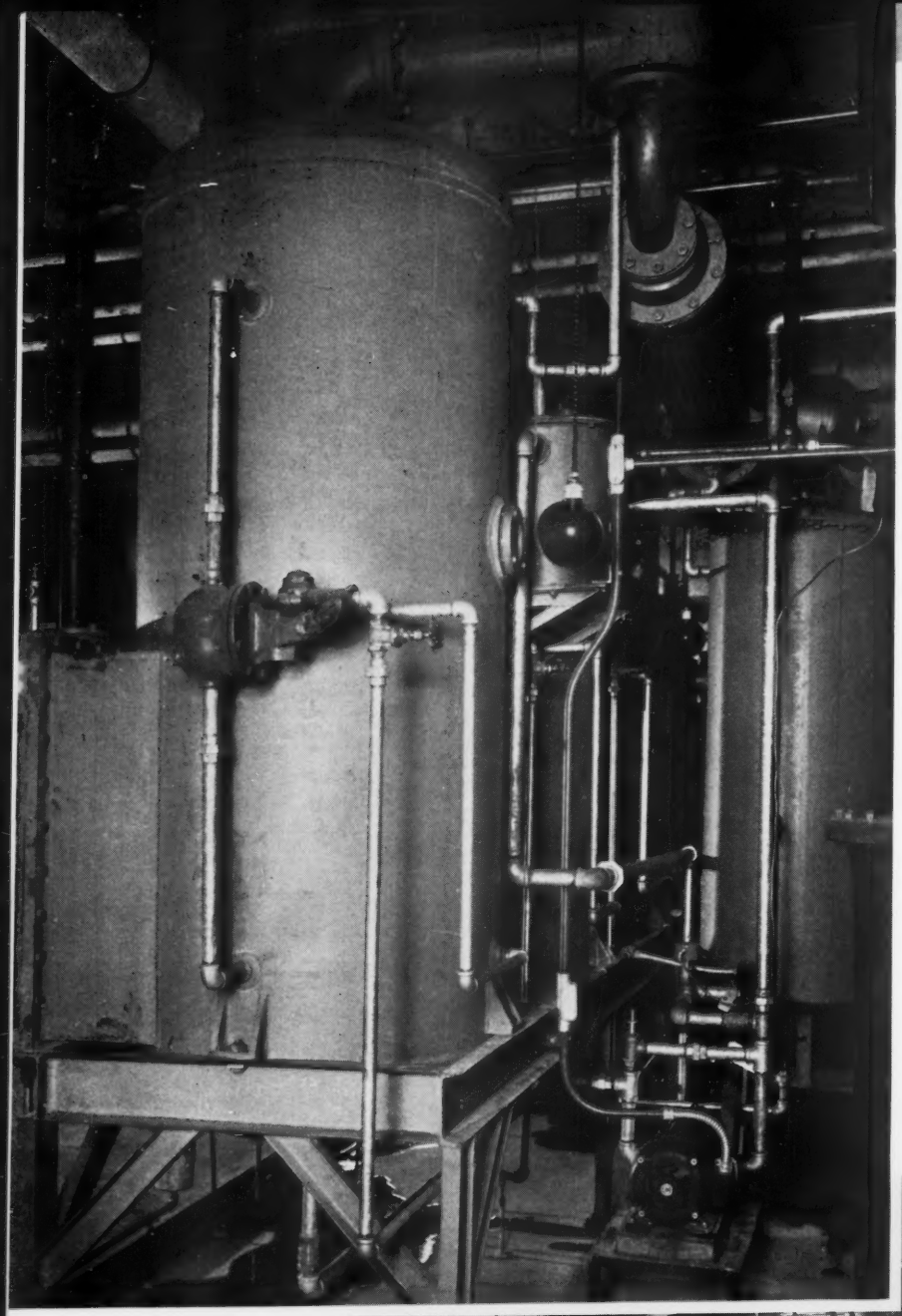


The Liquid "Double" labeler affixes a body label simultaneously to both sides of the container. It has eight heads and is equipped with two sets of label holders, gum boxes and pickers. Equipped for labeling one size and style of package with two body labels. Floor space, including conveyor and accumulating table, 5' 8" x 12'.



Liquid Single and Duplex Labelers—These labeling machines are completely automatic, bottles being fed into the machine, labeled, and discharged without being touched by hands. Will apply body, body and neck, or body, neck and foil in one operation. Liquid "Single" has capacity of 80 bottles per minute on splits and pints. Liquid "Duplex" will handle 120 bottles per minute.

Liquid **LIQUID LABELERS**



It

Left. Stokes Multiple-Effect Water Stills such as that shown, recently installed by Sharp & Dohme, produce distilled water of exceptional purity at savings in steam and water costs (as compared with single-effect stills) that will usually pay for the equipment in two years or less.

●

Below. Group of BB-2 Tablet Machines, each producing in excess of 1000 tablets per minute, in a large American pharmaceutical plant. This manufacturer has more than 100 Stokes Tablet Machines, plus tablet auxiliary and other types of Stokes equipment.

FJS
Est. 1895

Pays to MODERNIZE

Planned, consistent replacement of obsolete equipment does pay. Witness the enviable position of those plants which were already prepared to meet present emergency conditions.

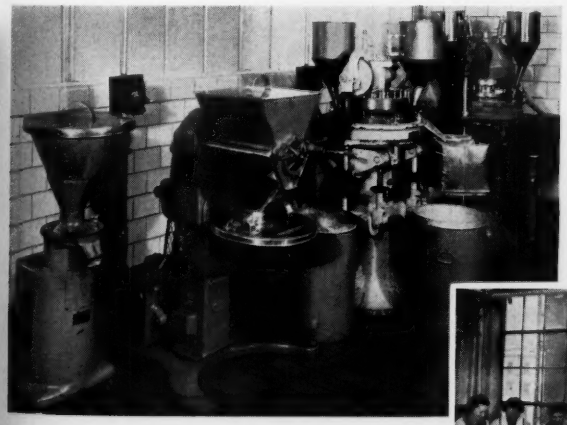
We know of no industry, other than the manufacture of pharmaceuticals, in which modernization pays bigger returns . . . none in which so small an investment in mechanical equipment will produce goods with so great a dollar value.

If obsolescent equipment happens to be one of your problems, we may be able to help . . . for Stokes equipment is modern, efficient, productive, profitable. A list of those who use it reads like a "Who's Who of the Industry." Stokes machines by the dozen, sometimes by the hundred, will be found in a single plant.

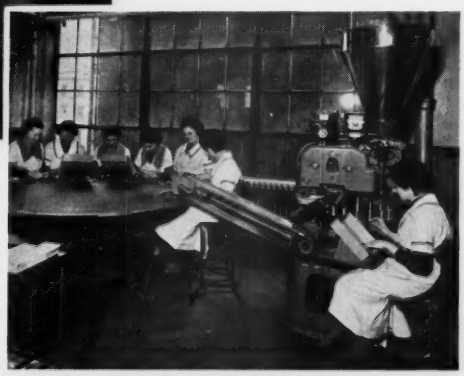
And always, from small hand-operated or laboratory models to full-automatic equipment for large-scale production Stokes machines are simple, rugged, dependable . . . the best machines we know how to build for the duties they are to perform.

Write for this Catalog

F. J. STOKES MACHINE COMPANY
5932 Tabor Road Olney P. O. Philadelphia, Pa.
Representatives in New York, Chicago, Cincinnati, St. Louis, Cleveland, Detroit
Pacific Coast Representative: L. H. Butcher Company, Inc.



Left. Installation of Stokes Drug Mill, Oscillating Granulator and BB-2 Tablet Machines. One group of several dozen machines in one plant.



Right. Stokes Full-Automatic Tube Filling, Closing and Sealing Machine. A fast, flexible machine, for large-volume production. Handles all liquids, semi-liquids and pastes, fills tubes of all sizes, makes various closures to suit the products.

SINGLE PUNCH TABLET MACHINES
•
ROTARY TABLET MACHINES
•
GRANULATORS
•
DRYERS
•
MIXERS
•
WATER STILLS
•
VACUUM STILLS
•
COATING AND POLISHING PANS
•
POWDER FILLERS
•
TUBE FILLING, CLOSING AND SEALING MACHINES
•
MISCELLANEOUS EQUIPMENT

F.J.Stokes **PHARMACEUTICAL EQUIPMENT** FJS Est. 1895

With a flair for developing profits in *your* business

● When the magic wand of Plaskon Molded Color touches your products, they spring into prominence with new life and lustre. The gay, sparkling tones of Plaskon make people *see* your merchandise, *reach* for it, *want* it . . . and *buy* it!

Plaskon Molded Color inspires profits in your manufacturing schedules, too, because it permits production economies and increased output.

Whatever you manufacture, you can find profitable use for Plaskon Molded Color, either as an integral part of the product itself or as a beautifying, sales-promoting, decorative unit.

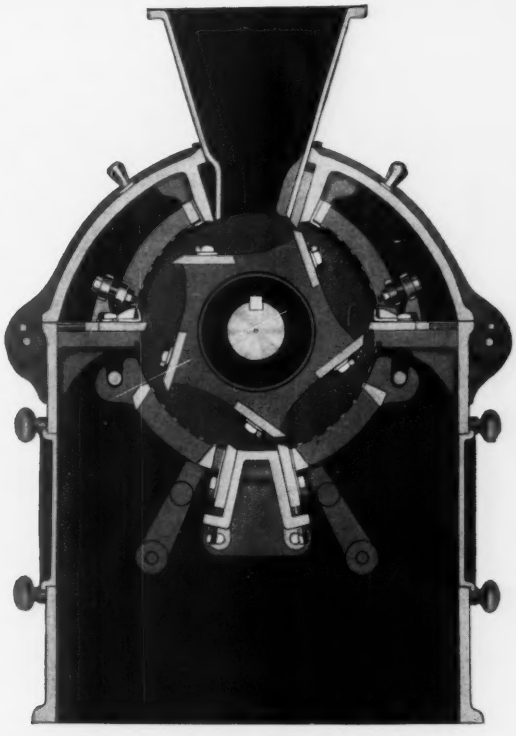
Plaskon is the world's largest-selling urea-formaldehyde plastic, furnished *only* in powder form. We can give you helpful assistance in the matter of designs, qualified Plaskon molders, and technical advice to help adapt Plaskon Molded Color to your manufacturing and sales program. Plaskon Company, Inc., 2110 Sylvan Avenue, Toledo, Ohio.

PLASKON

TRADE MARK REGISTERED

MOLDED COLOR

Your Milling Department



Cut shows construction of S-W Rotary Knife Cutter. Note the arrangement of knives and screen resulting in largest possible capacity per h.p.—maximum possible control of particle size. Just one of the many profit producing, labor saving machines Sprout-Waldron offers the drug trade.

CAN BE MADE MORE EFFICIENT AND A BETTER PLACE IN WHICH TO WORK!

HOW?

By following the example of Sharp & Dohme—securing the recommendations of Sprout-Waldron who manufacture cutting, grinding, mixing and sifting machinery together with elevating and conveying equipment and power transmission appliances, and who also offer a complete, experienced and practical engineering service.

Avail yourself of the experience of our engineers. Their recommendations are always practical and are offered to save money for you.

We have a field sales engineer near you. Ask for him to call to discuss your problem or write to us giving full details.

SPROUT, WALDRON & COMPANY, INC., 182 Sherman St., Muncy, Pa.

SPROUT, WALDRON & CO., INC.

Manufacturing Engineers . . . . Since 1866

CRUSHING, GRINDING, GRADING, PACKING, ELEVATING CONVEYING, MIXING AND POWER TRANSMISSION MACHINERY

Cuando la goma entra en contacto con los flúidos oleosos, la humedad, el calor o el frío extremados, surge una

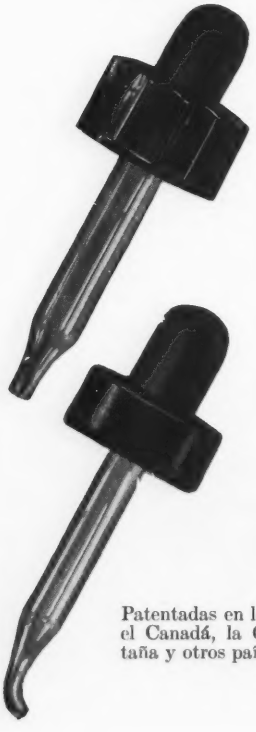
LUCHA POR SUBSISTIR

—en que la goma sale perdiendo siempre, a menos que sea de la calidad AMEKINE, pues AMEKINE es la mejor goma sintética, inodora, que existe hasta ahora. Fué perfeccionada especialmente para usarla en los cuentagotas NEW PERFECTION, con particularidad cuando van a usarse productos medicinales de naturaleza oleosa.

HISTORIA VERÍDICA

(Reproducción Fotográfica en Tamaño Exacto)

TAMAÑO ORIGINAL **24 HORAS EN KEROSINA** **48 HORAS EN KEROSINA**



ESTA reproducción fotográfica, sin retocar, muestra exactamente lo que sucedió a dos peras de goma del mismo tamaño original después que se sumergieron en kerosina durante 24 y 48 horas respectivamente. La primera pera es de goma sintética e inodora AMEKINE, y la otra es de goma natural de alta calidad. En esta prueba se empleó kerosina, debido a que en uno o dos días revela los estragos causados a la goma después de varias semanas o meses, por los flúidos oleosos u otras condiciones severas; la hinchará, suavizará, desecará, o desintegrara. ¡En cambio AMEKINE, lejos de deteriorarse, en efecto parece mejorar y adquirir mayor firmeza! ¡En lugar de endurecerse o resecarse, se vuelve más flexible!

MUCHAS CLASES DE GOMA SINTETICA CONTIENEN HASTA 50 o 60% de CAUCHO NATURAL, y despiden un fuerte olor que contamina las medicinas. ¡No deje usted que se experiencia con estas clases le influya contra AMEKINE! Pues AMEKINE contiene la menor cantidad posible de caucho natural—se aproxima hasta donde es posible, a ser un producto totalmente sintético. Durante un periodo de más de dos años, muchos de los principales fabricantes de productos farmacéuticos han venido usando con entera satisfacción grandes cantidades de peras de goma AMEKINE. El costo adicional es insignificante.

Gustosos le enviaremos a usted muestras de las peras de goma AMEKINE para que las someta en su laboratorio a las pruebas que desee.

PENNSYLVANIA GLASS PRODUCTS COMPANY, 418-420 N. Craig St.
PITTSBURGH, PA., E. U. A.

(No estamos afiliados a ninguna otra fábrica de productos de cristal).

Patentadas en los E.U.A., el Canadá, la Gran Bretaña y otros países.

New Perfection

PIEZAS Y CUENTAGOTAS COMPLETOS

SPECIFY HEYDEN FOR

Salicylates

METHYL SALICYLATE U.S.P.

Rely with confidence on the uniform purity of the Heyden brand to win increased consumer acceptance of your products.

•

SODIUM SALICYLATE U.S.P.

Large Crystals • Small Flo-crystals • Powder
Fine White Color and Complete Solubility

•

ACETYLSALICYLIC ACID U.S.P.

Crystals and Powder

•

ACETYLSALICYLIC ACID

10-16-20% Starch Granulations

•

SALICYLIC ACID U.S.P.

Pure Crystals and Powder

•

Salol U.S.P.
Calcium Salicylate
Strontium Salicylate N.F.
Magnesium Salicylate
Pentaerythritol
Write for Current Products List

FINE HEYDEN CHEMICALS

HEYDEN CHEMICAL CORPORATION
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Chicago Branch: 180 N. Wacker Drive

Factories: Garfield, N. J. — Fords, N. J.

BRIDGEPORT

LIPSTICK CONTAINERS

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COMPACT CASES

Bridgeport compact cases and vanities are outstanding for style and craftsmanship. Vanities of any type and design may be produced to specification to harmonize with any cosmetic line or color scheme.

THE BRIDGEPORT METAL GOODS MFG. CO.

Established 1909

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VANITY CASES • ROUGE CASES • PASTE ROUGE CONTAINERS • LIPSTICK HOLDERS (ALL TYPES) • POWDER BOX COVERS • EYEBROW PENCIL HOLDERS • BOTTLE CAPS • JAR CAPS • METAL NOVELTIES TO ORDER

When only the Best
IS GOOD ENOUGH!

. . . MM&R Essential Oils and Balsams are preferred

THE QUALITY LINE of ESSENTIAL OILS

MAGNUS, MABEE & REYNARD
IMPORTERS AND MANUFACTURERS
NEW YORK. U.S.A.
STRENGTH
ROSESOL—M. M. & R.
ALCOHOL 47% VOL.
A SOLUBLE PREPARATION FOR THE EXTEMPORANEOUS PREPARATION OF ROSE WATER
DIRECTIONS—DILUTE WITH DISTILLED WATER IN PROPORTION OF 1 OZ. ROSESOL TO 1 GAL. OF WATER
ESSENTIAL OILS-DRUGS-CHEMICALS
NET WEIGHT 1 LB.

QUALITY, *Yes*—EXTRA COST, *No!*

WHENEVER there can be no compromise with quality the *greatest preference* is for M M & R Essential Oils and Balsams.

For example, whenever doctors' prescriptions call for essential oils, more druggists and more hospital pharmacies* use M M & R products, distributed to them in familiar, uniform brown bottles by the great majority of the nation's drug wholesalers.

This preference by practicing pharmacists and service wholesalers is reflected in the *ever growing* number of drug and cosmetic manufacturers who are turning to M M & R for extra quality at no extra cost.

**Proved by actual survey*

MAGNUS, MABEE & REYNARD, INC.

QUALITY ESSENTIAL OILS, BALSAMS AROMATIC CHEMICALS, ETC. SINCE 1895

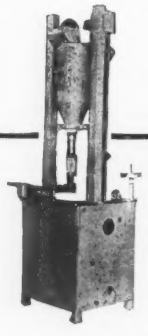
16 DESBROSSES ST. NEW YORK, N. Y.

CHICAGO: 180 N. Wacker Dr.

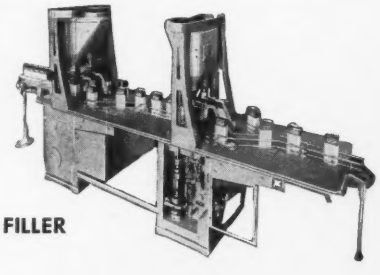
CANADA: Richardson Agencies, Ltd., 454 King St. W., Toronto

4 major companies . . .
4 problems in modernization

ONE UNANIMOUS DECISION: **S&S FILLERS**



S & S UNIVERSAL FILLER



S & S AUTOMATIC FILLER

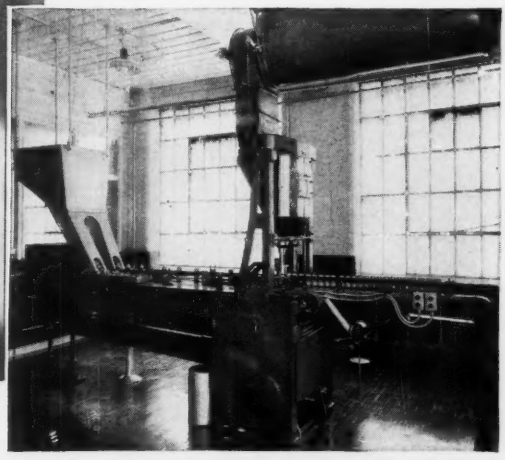
Sharp & Dohme

turns to advantage the versatility of the S & S AUTOMATIC FILLER . . . the one machine fills hospital, large and small sizes of B. F. I. . . . two sizes of BO-CAR-AL containers . . . and DEODO and AZOMIS tins . . . switching from one container and material to another with only a few minutes' work in adjustment.

●

Norwich Pharmacal Co.

meet the need for a machine to fill various types and sizes of containers with the readily adaptable S & S AUTOMATIC FILLER—AMOLIN, PEPTANS, VEEN and NORWICH ZINC STEARATE containers come off the modern production line shown below — speedily and efficiently filled.



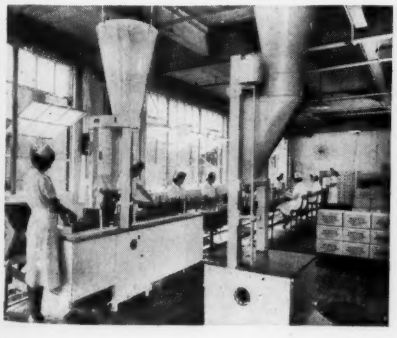
S & S UNIVERSAL FILLER	S & S AUTOMATIC FILLER
MATERIAL: Powders, granular products, pastes.	MATERIAL: Powders, granular products.
CAPACITY: ½ oz. to 5 lbs.—any container.	CAPACITY: 1 oz. to 2 lbs.—cans, boxes, canisters.
PRODUCTION: 15 to 30 per minute.	PRODUCTION: 60 to 120 per minute.
OPERATORS: One; filling by gross weight, volumetric measurement or packing.	OPERATORS: One; filling by gross weight, volumetric measurement or combination of both.

Grove Laboratories

fill famous PAZO ointment on the S & S UNIVERSAL FILLER. A simple adjustment and the same machine would fill a free-flowing powder — for, it fills practically any type of container with almost any kind of material!

Clark-Cleveland, Inc.

solved their problem with the S & S AUTOMATIC FILLER for production line work filling FASTEETH; high S & S speeds are an important advantage here.



THE WAY TO FILL PACKAGES FASTER, EASIER, CHEAPER!

Write us for data on these newest of Fillers; no obligation whatsoever.

STOKES & SMITH Co

PACKAGING MACHINERY — PAPER BOX MACHINERY

Summerdale Ave., near Roosevelt Blvd., Philadelphia, U. S. A.

Synfleur

REG. U. S. PAT. OFF.

BERGAMOL EXTRA

(Synthetic Oil of Bergamot)

The latest development of our Research Laboratories replaces the natural oil in any composition . . . gives the same "spread" and has a better "lift" in perfumes. Try Bergamol Extra in any formula and you will be amazed with the results.

Sample upon request. Write for prices in quantities.

Trial Pounds, $7.40

MADE IN U.S.A.

SYNFLEUR SCIENTIFIC LABORATORIES, INC.

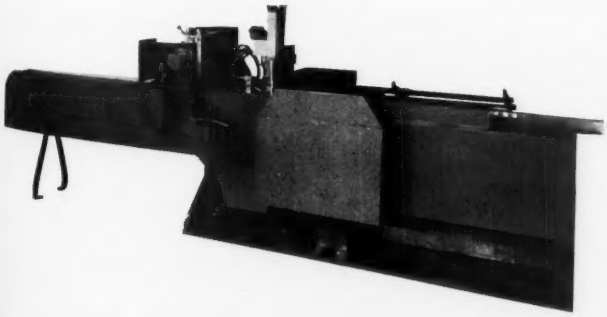
MONTICELLO, NEW YORK, U. S. A.

New York **Atlanta** **Detroit** **Chicago**
Mexico, D. F. **Buenos Aires** **Rio de Janeiro** **Havana**

Scores of *Modern* Drug Products Are Packaged on Redingtons

From the very beginning, back in 1897, Redington made the packaging problems of the drug industry its own. In fact, if there's *any one field* in which our engineers have specialized, *it's in the packaging of drugs*! In our 44-year history, many of the major improvements in methods and machinery have been *pioneered* by the Redington staff.

In a number of cases, packages have been greatly improved in appearance or customer-convenience . . . the design modernized or a new seal created. Often better means of producing the package have been developed, higher speeds set, unnecessary hand labor eliminated, output per square foot of floor space stepped up.



Notable example of a modernization program is the Grove Laboratories job. *Three* standard size cartons were substituted for *eight* . . . *two* sizes of circulars replaced *eight* . . . *one* size corrugated protector instead of *three*. This standardization saved thousands of dollars . . . still further economies were effected because *five* different Grove products are cartoned on *one* Redington . . . *three* produced on another.

Redington's part in modern packaging received new recognition with the *three* All-American Packaging awards for 1940—one, for cartoning Vitalis—the second for wrapping Listerine—and the third for filling tins of Bayer's Aspirin . . . all three products among the best known in the drug industry.

We've shown here only some of the many drug packages handled on Redington machines.

Our broad experience in the drug field has solved many problems.

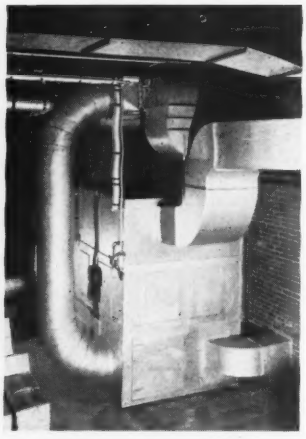
Why not put that experience to work on *your* problems. Write, without obligation.

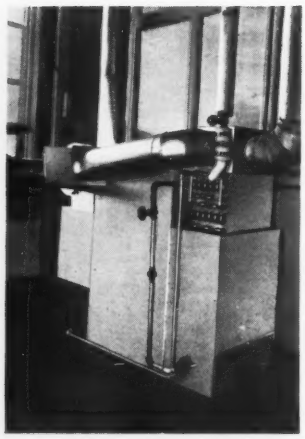
F. B. REDINGTON CO. (Est. 1897) 115 So. Sangamon St., Chicago, Ill.

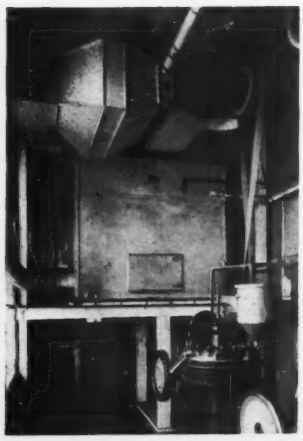
REDINGTON PACKAGING MACHINES ★

for CARTONING • WRAPPING • SPECIAL PACKAGING

LECTRODRYER







In the modernization programs of many of the larger pharmaceutical plants throughout the United States and in many foreign countries, special attention has been and is being paid to dehumidification. Dehumidification is of particular importance to the pharmaceutical industry because of the detrimental effect of water vapor in air on many of the products of this industry.

LECTRODRYER equipment has provided an ideal solution to the many different dehumidification problems set up by the industry. Coating pans are supplied with dry air from LECTRODRYER providing for smooth, even coatings. Liver extracts are dried with LECTRODRYER dehumidified air. Ampules are packed in a room kept at a constant, lower than normal, relative humidity with LECTRODRYER. Effervescent and hygroscopic tablets are processed, stored, or packed in rooms thoroughly dehumidified by LECTRODRYER. Moisture, with its harmful effects, is removed from the air breathed by medicinal oil and chemical storage tanks when they are emptied or when temperature changes cause contraction of air, by the LECTRO-BREATHER.

LECTRODRYER has been widely accepted throughout the pharmaceutical industry because it provides a thorough, dependable and economical method of maintaining any desired lower than normal relative humidity. LECTRODRYER is a sturdily built and thoroughly

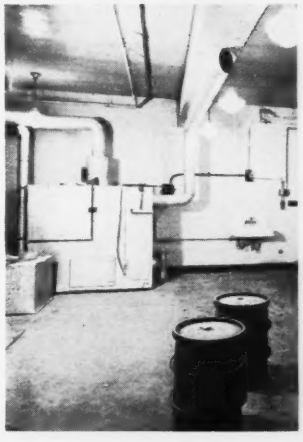
PITTSBURGH LECTR

FOOT OF 32nd STREET

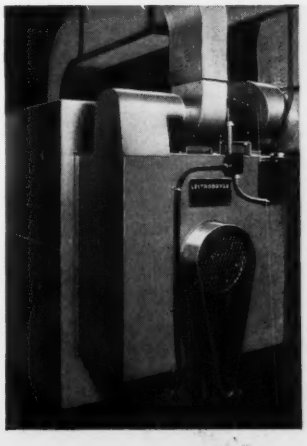
"FOR MODERNIZED DEHUMIDIFICATION"

tested industrial machine, designed to serve its user for periods of years with little or no manual attention and no regular replacements of materials or overhaulings. LECTRODRYER uses the "Activated Alumina System" of dehumidification, providing for solid adsorption of moisture without the use of refrigerants or messy or corrosive chemicals. Activated Alumina, the solid adsorbent used, has been used in LECTRODRYER equipment for many years without noticeable deterioration or loss of efficiency.

LECTRODRYER equipment is particularly suited to the pharmaceutical industry since it makes possible the control of dehumidification independent of temperature control. LECTRODRYER may be used with refrigeration (either mechanical or water cooling) to provide complete air conditioning, or alone, when temperature control is not required.



LECTRODRYER equipment is available in a wide range of standard sizes and types. Flow rates range upward from three hundred and fifty cubic feet per minute. Operation is from steam, gas, or electricity, whichever is specified by the purchaser. Units are shipped complete, in most cases, ready to connect to the purchasers ducts and service lines. A new catalogue illustrates and lists data on many LECTRODRYER units. A copy will be mailed to you if you request it. Write today.



RYER CORPORATION
PITTSBURGH, PA.

Parade of STOCK Bottles
Drawn up for inspection are eight of the many attractive Swindell bottles that can be supplied from stock, making it possible for you to enjoy the sales advantages of smart packaging without a heavy investment in bottles.
BACK ROW (left to right)
C-39: ½ oz. to 16 oz.
D-62: ½ Dram to 8 oz.
A-273: ¼ oz. to 16 oz.
A-347: 1¼ Dram to 8 oz.
FRONT ROW (left to right)
J-32: ½ oz. to 16 oz.
A-539: ½ oz. to 32 oz.
A-415: 1 oz. to 4 oz.
A-682: ⅛ oz. to 4 oz.
SWINDELL BROS.
BALTIMORE • MARYLAND
Latin American Representative
MR. ROBERTO ORTIZ, HAVANA, CUBA
200 FIFTH AVE
NEW YORK
When you think of bottles think of
Swindell

INDOLINE

Not a substitute for INDOL but a product superior in

LASTING QUALITY
SWEETNESS and
PERFUME VALUE

Please Write for Free Sample

Norda

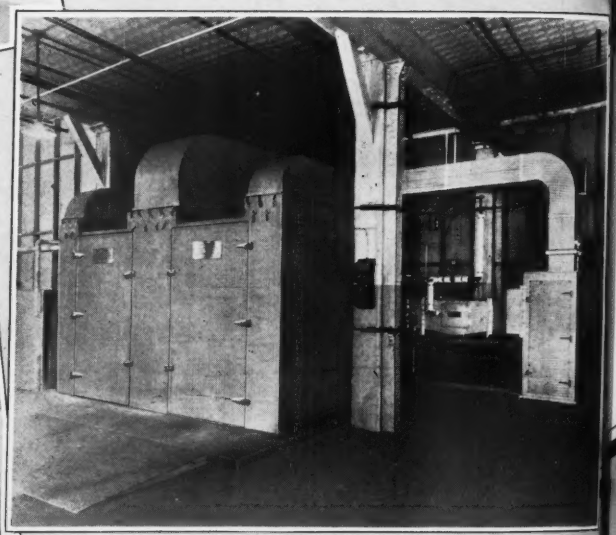
ESSENTIAL OIL AND CHEMICAL COMPANY, INC.

NEW YORK OFFICE
601 WEST 26TH STREET

CHICAGO: 325 W. HURON STREET
LOS ANGELES: 2800 E. 11TH STREET
ST. LOUIS: 1123 WASHINGTON AVE.
FRANCE: PLACE VENDOME, 8, PARIS
ST. PAUL: 253 E. 4TH STREET
HAVANA, CUBA: SAN LAZARO #671
CANADA: 119 ADELAIDE ST., W. TORONTO
135 COMMISSIONERS ST., WEST, MONTREAL
ENGLAND: 17 CREECHURCH LANE, LEADENHALL ST., LONDON, E. C. 3

SAVING 50% TO 85%

Close-up view of apparatus showing humidifier, cooling coils, heating coils, automatic diaphragm type valves, outlet air filter casing, supply and return air duct work, and air compressor for furnishing compressed air to controls.



General view of the dryer and of the part of the apparatus with return air filter casing and multiblade dampers.

All controls are centralized on two panel boards.

AIR FOR YOUR PROCESS 0° TO 1000°

J. O. ROSS E

OF DRYING TIME

ROSS Modern Production DRYING

This modern Ross Dryer installed for a prominent drug plant is actually doing the work that would ordinarily require from two to seven old type dryers. Built of thick insulated steel panels, heat losses are kept at a minimum. Despite the remarkable SPEED of drying, the product is being produced with exact final moisture content. These and other profit earning features are typical of scores of other Ross installations. Why not consider the possibilities for your plant and product? Write us!

OTHER PROFIT EARNING FEATURES

CLEANLINESS

Entire volume of circulated air is filtered twice prior to its entrance into the dryer. All parts readily accessible for inspection and cleaning.

VERSATILITY

Circulated air can be humidified, dehumidified, heated or cooled over a wide range, thus making it possible to handle quite a variety of products.
Fresh air could be introduced at the rate of from 0 to 100% of the total air circulation.

EFFICIENCY

Uniform air circulation over all trays, regardless of their physical location on the truck, thus insuring even drying results.

SIMPLICITY

All controls are centralized and the entire system is placed into operation and shut down from a single push button station.

ENGINEERING CORP.

350 MADISON AVE., New York, N. Y.
12953 Greeley Ave. DETROIT
201 N. Wells Street CHICAGO

No. 33473

The sardine can that gave father fits

The Story of a Packaging Problem

FATHER'S fishing trips generally went smoothly until he tackled his lunch.

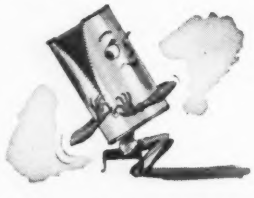
Then, while the coffee came to a boil, father'd turn his attention to the sardines. Always an optimist, he'd start twisting the opening key with bland assurance. And for a few turns all would be well.

Then the key would get balky. Father would pause, take a firm grip on the key and a still firmer one on his temper. The key would still refuse to budge. So father usually resorted

to anything from a gaff to a camp axe to use as an opener for the sardine can.

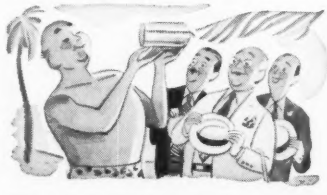
Sometimes, father would win. Sometimes, the can would. In either case, the birds and the squirrels heard a lot of new words.

Today, hundreds of millions of key-opening cans, in which rest sardines, meat, coffee, vegetable compounds, and what-not, are as easy to open as if they had zippers.



This *is* a change. And what brought it about? A man whose calling in life was dentistry . . . American Can Company . . . *and the thickness of three human hairs!*

This dentist, when he wasn't pulling teeth, was an inventor. The patent on one invention (#1298683) described it as "an improved tearing strip for key-opening cans."



When we at American Can Company looked into this patent, we found that this dentist had almost hit it. For in most cases his improved strip tore evenly and cleanly, wound up into a neat little roll on the key as you turned it.

Still—this improvement would go haywire quite often . . . annoyed us. So we went to work.

We found we could *improve* even the "improved" tearing strip by controlling the depth of the scoring.* So this story gets into our laboratories . . . gets way in . . . *under a microscope.*

For the "depth" we're now talking about is microscopic. Nobody had ever measured the depth of such tiny scoring lines before. There were no instruments to do it. There was no method.

So we invented one—a costly, complicated mechanism. It cost thousands of dollars. And all it does is

simply measure and control *six thousandths of an inch* . . . the depth of a scoring line, which is about the thickness of three human hairs!

The result has been worth many times what it cost in money, time, and brains. For today we make hundreds of millions of key-opening cans a year—and believe it or not—*not one goes haywire!*

This taming of the key-opener typifies the inordinate pains to which

American Can Company will go in ironing out the details of any packaging problem.

CANCO

What American Can Puts Against Packaging Problems

- 5 laboratories employing 134 people college trained in the pure, natural, and engineering sciences.
- 13 points from which customers' machinery is serviced . . . 6 points at which customers' machinery is built.
- 67 plants located strategically in the U. S., Canada, and Hawaii.
- A factory-trained sales staff who are specialists in many different types of industry.
- An executive personnel backed by a financial strength that is in itself a tangible business asset.

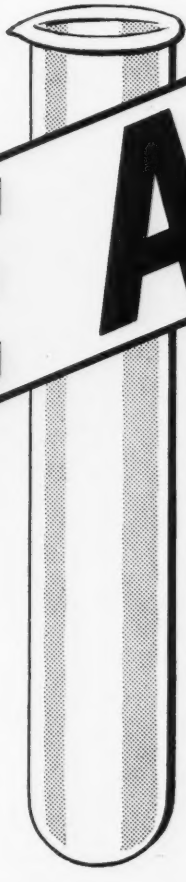
AMERICAN CAN COMPANY

230 Park Avenue • New York, N. Y.

**Scoring.* Can manufacturers' term for the tiny, parallel scratches at the edge of a can which are cut by knife edges into the tin plate.

NAUGATUCK

MOUSSE A



a synthetic
oak moss ——
accepted by the trade

NAUGATUCK AROMATICS
DIVISION OF UNITED STATES RUBBER COMPANY
12 EAST 22nd STREET • NEW YORK, N. Y.
215 W. OHIO STREET, CHICAGO, ILL. • H. M. ROYAL, Inc. 4814 LOMA VISTA, LOS ANGELES, CALIF.

IT CAN HAPPEN HERE

The counter is the crucial point for every cosmetic manufacturer. It is the spot where the customer buys your products in good faith.

But, will you keep her good will if,—a lipstick she buys is marred or messy; a face powder box carelessly assembled; a face cream jar unevenly filled; or a lotion shows precipitation?

Such things *can* and often *do* happen, with the result that future sales are lost. This is why great care should be exercised in the selection of your manufacturing source for cosmetic specialties. The name ALLIED is your *guarantee* that the products you purchase are worthy of bearing your firm's name; and worthy of your customers' confidence. The name ALLIED means that every item released has undergone a most rigid inspection by highly trained ALLIED inspectors whose skill is characterized by their precise observations of finished products rather than by the number of products passed. Buy ALLIED! *Be sure! Protect customers! Protect* future profits!

LIPSTICKS APLI • ROUGE SUPREME • FACE POWDER APLI • MASCARA APLI • EYE SHADOW APLI
OTHER ALLIED SPECIALTIES: TALCUM POWDERS • DUSTING POWDERS • FACE POWDERS • PERFUMES
TOILET WATERS • SACHETS • MANICURE PREPARATIONS • CREAMS • LOTIONS • DEODORANTS
DENTIFRICES • BATH SALTS • SHAVING PREPARATIONS • SKIN TONICS • HAIR AND SCALP PREPARATIONS

ALLIED PRODUCTS, Inc.

30 ROCKEFELLER PLAZA, N. Y. C.

MAKERS OF THE WORLD'S FINEST COSMETICS AND TOILETRIES
PLANT AND LABORATORIES: SUFFERN, NEW YORK

Simplify and broaden your use of the popular Cyclamen note — with this new technical achievement

CYCLAMEN ALCOHOL
and Cyclamen Acetate Butyrate and Propionate

★ by Albert Verley, Inc. ★

Through a new process discovered by Dr. Albert Verley, it is now possible to provide Cyclamen Alcohol — as a form far more satisfactory than the aldehyde, and possessing extremely interesting possibilities for the perfumer.

The alcohol gives a much lighter fragrance which can be used more freely — with a fresher, more floral effect.

It is likewise more versatile. Its use need not be so much confined — either as to purpose, or the quantity employed. In fact, it gives you new creative freedom not only in Cyclamen compositions, but also in the fabrication of virtually all the Spring flowers — such as lilac, lily-of-the-valley, rose, violet, and gardenia—as well as many bouquets.

A working sample may give you a fresh start toward new, successful creations. Write for it today.

★ *Albert Verley* AROMATICS

ALBERT VERLEY, INC., D. A. Bonnett, *President* • 1621 CARROLL AVENUE, CHICAGO, ILLINOIS
114 EAST 25th STREET, NEW YORK • MEFFORD CHEMICAL COMPANY, LOS ANGELES

Jasmine No. 1000

The scarcity of Jasmine Absolute need not effect your product. Our Jasmine #1000 is the ideal substitute, containing all the odoriferous constituents of the fresh blossom. Extremely concentrated, it is effective even in minute quantities.

Schimmel for Synthetics

SCHIMMEL & CO., INC.

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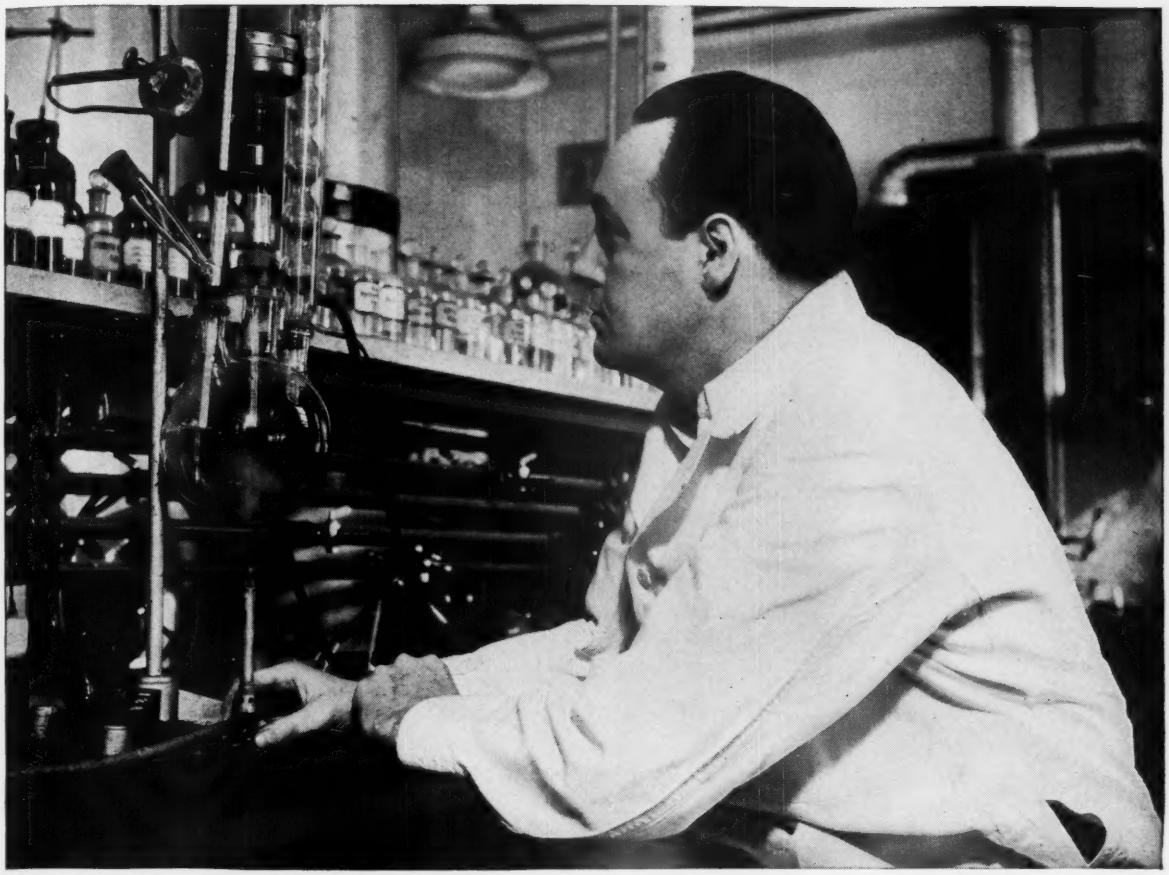
CHICAGO · CINCINNATI · CLEVELAND · LOS ANGELES · MINNEAPOLIS · NEW ORLEANS · ST. LOUIS



One of the FIRST LINES OF DEFENSE is the MAINTENANCE OF HEALTH

The HEALTH of our ARMY, our NAVY and our CITIZENS is as important to the national welfare as arms and ammunition.

N. Y. Q. is doing its part by producing drug and chemical materials . . . not just up to standard quality . . . but above standard. Research is being carried on constantly to assure highest quality and to control manufacture from raw materials into finished substances.

MANUFACTURERS OF: Bismuth Subcarbonate . . Bismuth Subgallate . . Bismuth Subnitrate and other Bismuth Salts . . Brucine Alkaloid . . Brucine Sulfate . . All Salts of Cinchona Alkaloids . . Codeine Alkaloid . . Codeine Phosphate . . Codeine Sulfate . . Iodine Resublimed . . Iodoform . . Menthol-Y . . Morphine Alkaloid . . Morphine Sulfate . . Opium Gum (Gran. and Powd.) . . Potassium Iodide (Cryst.—Gran.—Powd.) . . Quinine Sulfate and other Quinine Salts . . Strychnine Alkaloid . . Strychnine Sulfate . . Thymol Iodide . .

THE NEW YORK QUININE & CHEMICAL WORKS INC.

NYQ

GENERAL OFFICES

99-117 North Eleventh Street, New York, Borough of Brooklyn

ST. LOUIS DEPOT, 915 MARKET STREET, ST. LOUIS, MO

NYQ

COSMETICS DESIGNED FOR YOU

THE products that you sell should be worth the effort you put behind them. Utmost consideration should be given to the selection of the manufacturer of your cosmetics, for your best sales' efforts can be nullified by the lack of quality, or uniformity, or service.

By selecting our organization, you can give your undivided attention to sales' efforts with a feeling of utmost confidence in your cosmetics, for we offer you experienced manufacturing with ample factory facilities to produce quality products with prompt service.

Further, our formulae are not cook book recipes—we have a staff of highly trained chemists recognized as cosmetic authorities who are responsible for the formulation of your products. We are unique in our creative ability and research facilities to provide cosmetics designed for you.

Also, you may feel secure that our thoughts and efforts are for you. We carry products liability insurance. We are familiar with government activities and your cosmetics by us fully comply with all regulations. Our assistance in conforming labels and advertising to government trends is a part of our service.

And for your European and English markets, we have an "Americanized" English factory located near London. For your convenience there is a director permanently located in New York City.

We solicit an opportunity to write or call on you to explain particulars.

Evans Chemicals Limited
Boreham Wood
Herts, England

Evans Chemetics, Inc.
33 West 46th Street, New York
Telephone Bryant 9-6805

(Cosmetic Manufacturers with Unique Research Facilities)

LUSTEROID

MAKES ONE OF OUTSTANDING PACKAGES IN ALL-AMERICA

THE Disston File package is a fine example of the creative packaging possibilities of Lusteroid transparent rigid cellulose tubes. It takes the Swiss pattern files out of their traditional wooden box and puts them into a functional transparent tube. The mechanic can tell at a glance which file he wants and remove it without delay.

The excellent labelling possibilities of Lusteroid packages are demonstrated in the three color Disston label *made integrally with the package.* And the deep threads on the neck indicate how adaptable are Lusteroid containers to various types of closures. The extremely light weight and great strength of Lusteroid are well displayed in this tube. Thin as it is, it holds and protects 11 steel files. It gives, but does not break—may be d r o p p e d a n y number of times without injury to itself or its contents.

The corrugated plastic insert for holding the files separately is manufactured by the Sillcocks-Miller Company.

Lusteroid has found wide use in the drug and cosmetic industries, packages such diverse products as petroleum and files with equal success. A note or phone call will bring an answer to your packaging problem.

LUSTEROID CONTAINER CO. INC.

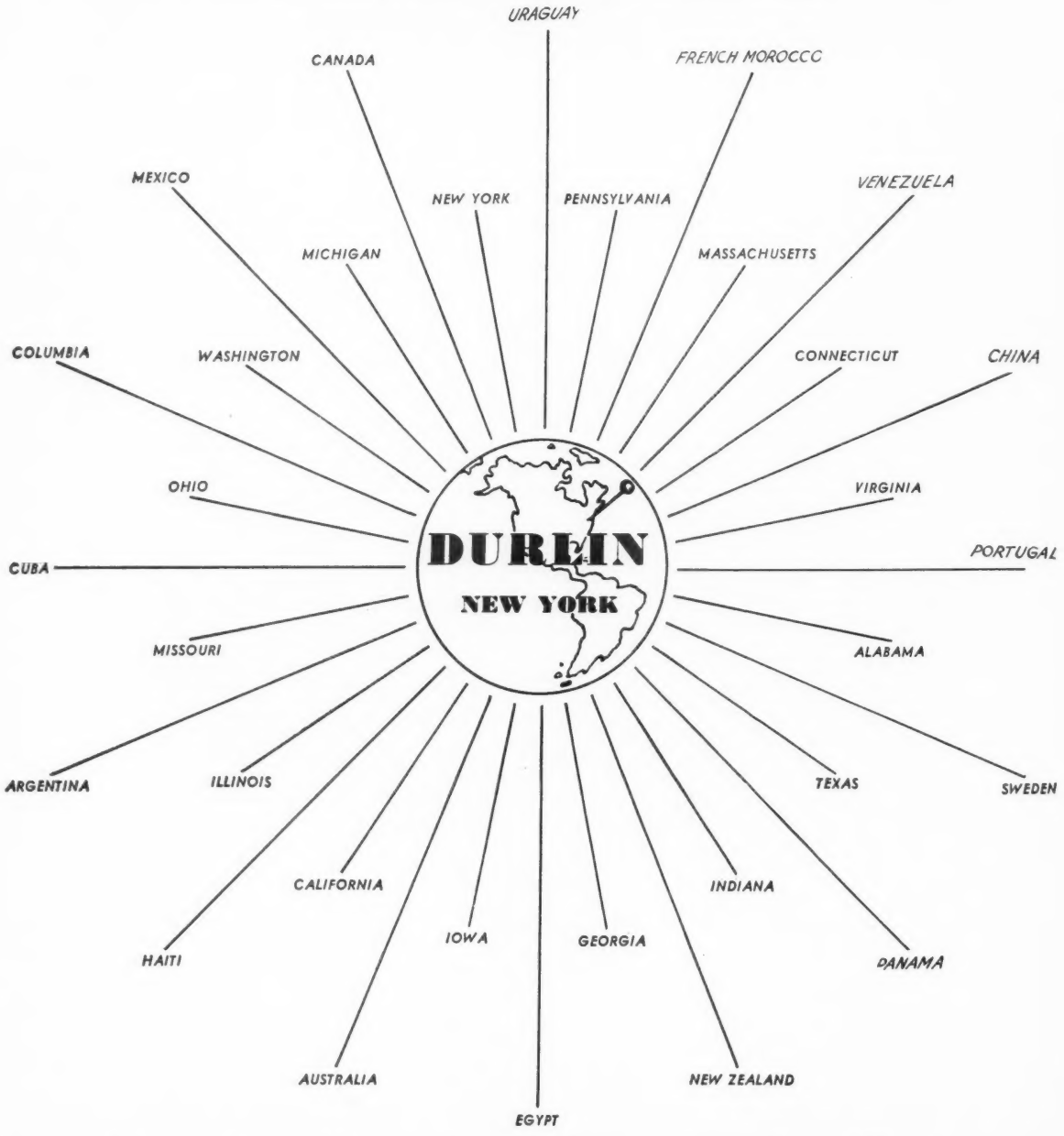
FORMERLY LUSTEROID DIVISION OF THE SILLCOCKS-MILLER COMPANY

PARKER AVEVUE WEST SOUTH ORANGE, N. J.

HANDS AROUND THE WORLD!

Durlin NAIL ENAMEL *is International*

WE SHIP TO EVERY QUARTER OF THE GLOBE



Get right • Keep right • Stay right—Buy Durlin

THE DURLIN CORPORATION

Producers of the Most Talked About Nail Enamel

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CABLE "Durlin, New York"

MODERNIZATION

Now that we are confronted with the prospect of a great and bloody war, in which efficient factories are as necessary to the nation's continued existence as an "army with banners," we must modernize our plants with ever accelerating speed. Surely few trades need plant modernization more than this one. Until the depression struck, operating costs were not a major concern. The margin of profit between actual manufacturing cost and net sale price was still very great. Selling took precedence over production. Hence, our methods were slipshod, our equipment in many cases antiquated and poorly laid out, and as a rule, our plants were by no means as clean as they could be. Our primary aim was to service our customers with goods of high quality and we did not worry particularly about operating costs. Our research laboratories were years ahead of our factories. The depression *plus* constantly stiffening competition *plus* intensified federal regulation *plus* increasing wages and shortened hours *plus* increasing material prices have at last focused attention on operating costs and modernization has become the watchword of the day.

Modernization means more than the establishment of efficient working nuclei, efficient equipment, and better working conditions for employees; modernization also means the establishment of cost and quality consciousness in all our people as a continuing spiritual force. In all of the ensuing articles, the effect of modernization on improving morale, reducing costs, and improving quality is emphasized. Again and again it is reiterated throughout the articles included here that the plants which have been modernized received a far greater return than they expected to get. The reason for this is that a modernization program restores order and cleanliness to the places in which people must work and it multiplies the capacity of existing buildings. It is significant that no modernization program has been undertaken in this trade during the past ten years which was not highly successful from a financial standpoint. It is also significant that the healthful surroundings provided for workers contributed an enormous amount to their per capita output.

Modernization is an awakening process. Methods and equipment and layouts which have been in use for years are rearranged to bring order and cleanliness and beauty into the factory. And once accomplished modernization remains as a stimulating force which creates in all executives and workers a keen desire for continuing improvement.

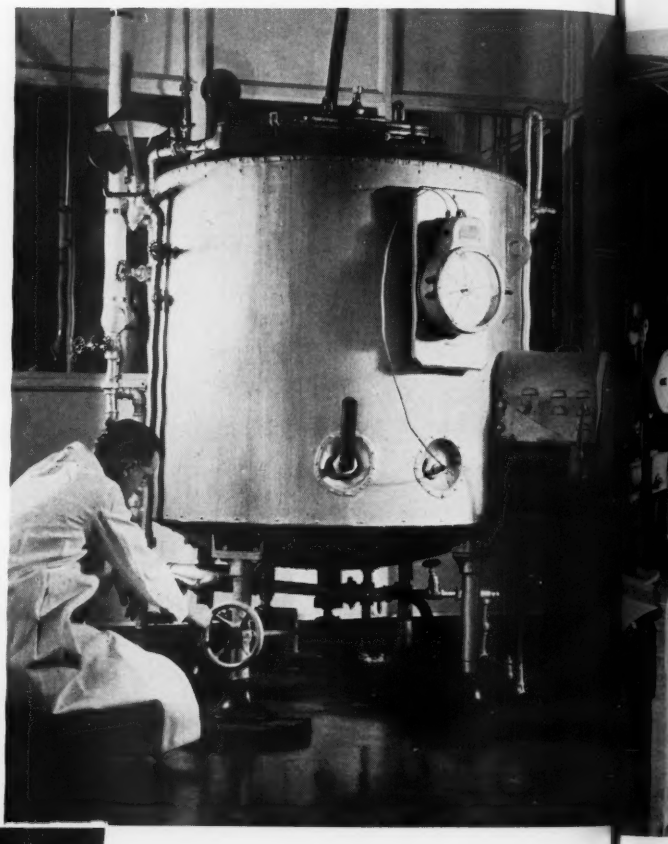
Francis Chilson

MODERNIZATION AT SHARP

By FRANCIS CHILSON

THE extensive plant modernization program recently completed at Sharp and Dohme is an excellent example of the value of a periodic overhauling of plant facilities. The Sharp and Dohme building is a 9½ story structure containing, with its four-story annex, approximately 400,000 square feet of space. A survey of the building and of the existing layout and equipment led to the conviction that many of the original defects in layout could be corrected and that working conditions throughout the plant could be enormously improved. It was determined by the new management to spend as little as possible in the form of fixed improvements to the building and to concentrate its modernization investment on the correction of the existing layout, on the purchase of modern equipment, and on improved facilities for the comfort and convenience of workers.

With the foregoing policy as a guide, the modernization program was undertaken. As a first step in order to straighten out flow lines and to place related departments in adjacent areas, an ideal layout for the existing building was prepared. This layout was predicated on the assumption that the building was entirely empty and that no obstacles would conflict with its execution. An isometric drawing of the entire building was made so that the entire 9½ floors and basement could be visualized at once and the relation of each department



At the left is a view of the making of sterile solutions, and directly above is shown a temperature controlled processing tank. A section of the Tablet Department is shown on the opposite page, as well as a view of the feeding of the drug mills.

RAND DOHME

to the other clearly revealed. Having prepared this ideal layout, a similar drawing of the entire building was prepared showing the existing layout. These two layouts were very carefully studied in order to come as close as possible to an ideal layout without having to move departments containing an immense amount of expensive plumbing, wiring, and heavy equipment such as the extraction department, printing department, liquid manufacturing department, and others. As a result of this study, a third drawing was prepared as a guide for the modernization program and detailed layouts were made from this. It is significant that it was possible by this means to achieve many of the functional principles of the ideal layout without moving departments which would have entailed a great deal of expense that could not have been economically justified.

The purpose of the ideal layout was to group functional areas in an integrated manner and in logical relation to each other. A comparison between the original layout and the ideal layout shows that this aim was very largely achieved without moving major departments. This comparison also shows that certain departments in the original layout were located as they would have been had it been possible to have made an unrestricted layout.

Beginning with the first floor, the ideal layout utilizes this floor as a service area for centralized locker rooms, cafeteria, and employee services of one kind or another, together with maintenance departments and the printing plant as well as the receiving and shipping departments. With the exception of the cafeteria and printing plant this was achieved in preparing the modernized layout. The first floor now has centralized locker rooms for factory and office men and women. Provision also is made on the first floor for a tank room so that drums of glycerine and alcohol can be dumped directly into large tanks to save the necessity of taking the drums up through the building and of returning the empties. The first floor of the annex is used for the storage of filled and empty drums and is used also as a receiving department for materials of this character.

In connection with the annex, there is a radical difference between the ideal layout and the modernized layout. In the former, the four-story annex building is set aside for the purpose of storing, milling, and extracting crude drugs, of distilling extracts, recovering solvents therefrom, and for disposing of exhausted marc. All operations connected with the conversion of crude drugs were, in the modernized layout, removed from the annex and taken to the ninth floor of the main building where a drug mill and moistening department was established. This was done because it was much easier to establish the drug milling and moistening department on the ninth floor where it could feed by gravity the extraction department which is located on the eighth floor, than it would have been to have re-

MODERNIZATION AT SHARP AND DOHME

By FRANCIS CHILSON

moved a very expensive extraction and distillation setup from the eighth floor into the annex.

The four floors of the annex were taken over for storage purposes and the kind of storage on each floor is the same as that on the adjacent floor of the main building with which it abuts. At the same time, belt conveyors were installed in the annex building to carry bottles from the street to the fourth floor. The effect of this was to relieve the truck congestion formerly occurring on the street at the opposite side of the main building. Moreover, concentration of the bottle stock on the fourth floor of the annex made containers directly accessible to the packaging department located on the fourth floor of the main building.

Going upward, the ideal plan used the second floor of the main building for the storage of finished goods in cases, for packing orders, and for assembling them for shipment. The modernized layout uses the second floor for the storage of finished stock in cases and also for assembling outgoing shipments. The printing, cafeteria, and "Sucrets" departments occupying the opposite end of the floor remain where they were originally because of the expense involved in moving them and the impossibility of making substantial economies by so doing. In both instances the shipment assembly areas of the second floors communicate with outgoing trucks on the street platform by means of belt conveyors.

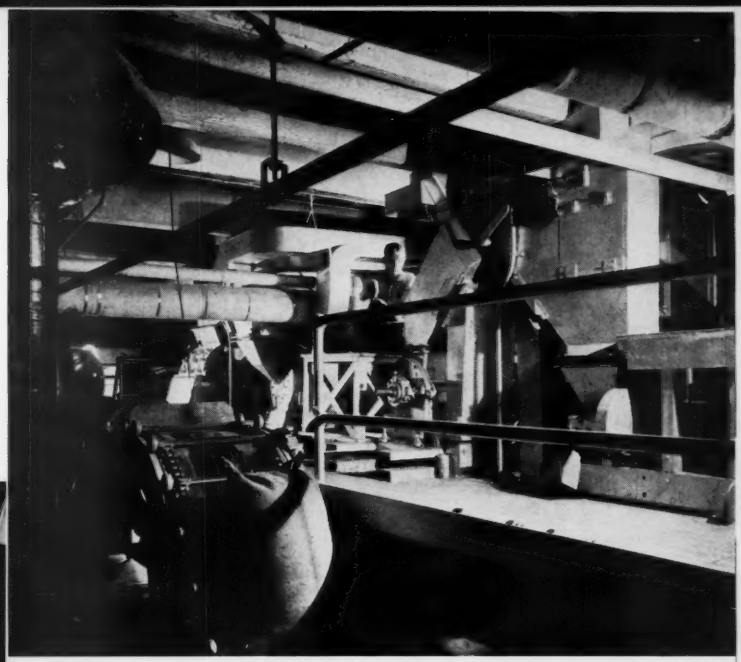
In the ideal layout, the third floor is used for finished shelf stock and also for the shipping department. In the modernized layout, it is used for the same purposes plus the packing department, and the same floor of the adjoining annex is used for the storage of packing materials and finishing stock in cases.

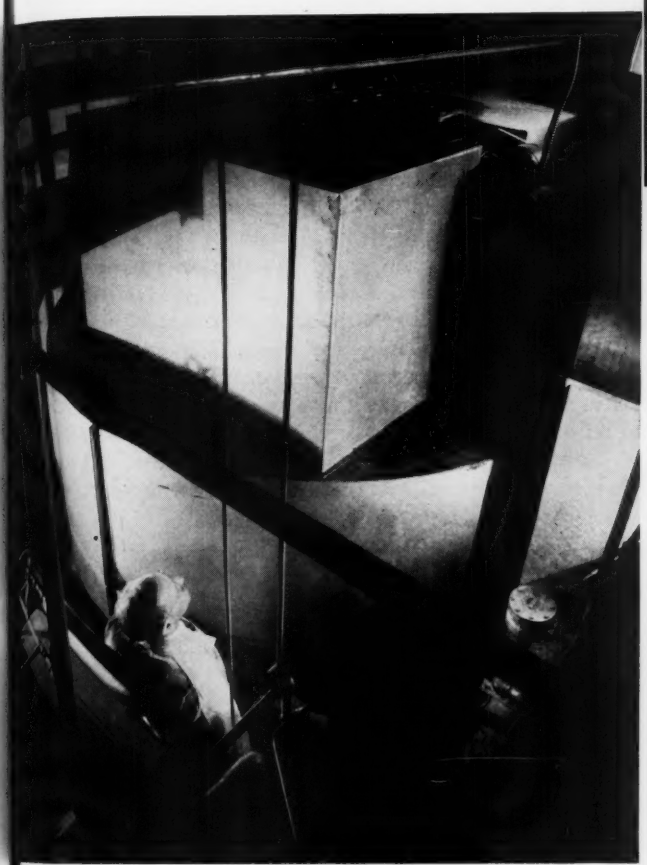
In the original layout, the shipments were packed from the shelf stock on the third floor and sent in tote boxes to a packing department on the second floor. This entailed a great deal of handling of the tote boxes and, because of limited space on this floor, it also entailed a great deal of rehandling of the packed shipments as they were being assembled for the outgoing trucks. In the modernized layout, the shelf stock and packing department are located on the same floor; hence, tote box handling has been done away with. The packed orders are delivered by means of a conveyor from the third to an assembly point on the second floor. Adjacent to this assembly point provision was made for the storage of "Sucrets" antiseptic throat lozenges and "S.T. 37" antiseptic solution. By installing a conveyor on this floor and connecting it up with chutes from the packaging department on the fourth floor, these items can be taken directly off the conveyor and stacked as high as possible and the same line of conveyor can be used to carry them from the stacks to the assembly area to be stenciled for shipment. Thus it is seen that the first three floors in the modernized layout compare favorably with the first three in the ideal layout, the changes made having been effected at relatively small expense.

Half the fourth floor in the ideal layout was to have been used for packaging of liquids, tablets, and other pharmaceutical products. The other half was to have been used for storage of other pharmaceutical materials used in producing these items. Exactly the same result was achieved in the modernized layout. All of the packaging operations formerly scattered on the first, third, and fifth floors were brought together in one consolidated area on the fourth floor, and this area is located between the bottle stock on the fourth floor of the annex and the general packaging material stock on the opposite end of the fourth floor of the main building. The packaging lines that formerly were arranged to run parallel with the building now run across it to a series of chutes which convey the finished packages to a distribution point on the third floor from which point they are put into stock. These chutes are arranged so that the third floor can be bypassed and materials carried to the case stock areas on the second floor as well.

The fifth floor of the ideal layout was to have been used for special manufacturing and packaging operations which advantageously are carried out together. Ointments are a case in point. Since the company, in addition to certain large run ointments, which could have been fed by gravity to other floors for packaging purposes, also makes a great variety of ointments in small lots which could not be so conveyed, it is obviously desirable to keep the packaging of ointments adjacent to the point where they are made. The same thing applies to suppositories and to the manufacture of effervescent salts which requires a dehumidified area. The same thing might also be said of "Sucrets." Since a substantial amount of equipment is involved in making "Sucrets," effervescent salts, ointments, etc., it was felt that a consolidation of these departments could not be economically justified so they were left

A view on the drug mill mezzanine is shown at the right, and below is a view of the Lectrodryer for the Coating Department.





where they originally were on the sixth floor and, in the case of "Sucrets," on the second.

In the modernized layout, half of the fifth floor was used for the storage of chemical stock. This location was selected because a study showed that 45% of the total number of formulas weighed out in the chemical stock department were delivered to the pill and tablet departments which occupied the other half of the fifth floor. The study revealed that 40% of the number of formulas were delivered to the liquid manufacturing, suppository, and ointment departments on the sixth floor. Thus, by having the chemical stock department moved to the fifth floor from the eighth floor, where it was in the original layout, it was possible to secure a centralization of the chemical stock between the principal manufacturing departments to which 95% of the formulas are delivered. In the original layout, moreover, the tablet, pill, and coating departments already occupied half the fifth floor. Such a department would have been very expensive to move entirely, so its modernization was confined to a rearrangement of the granulation and compressing areas, the installation of more modern equipment in the form of dryers, air conditioning and dehumidifying equipment, dust collection equipment, presses, etc., and to this floor were also brought dry capsule filling, powder manufacturing, and the manufacture of effervescent salts.

There is a radical difference between the layout of the sixth floor in the ideal layout and that shown in the modernized layout. In the ideal layout the sixth floor was to have been used for the bulk storage of liquids, pill and tablet making and coating, and for certain incidental operation departments. The sixth floor in the modernized layout is used for the manufacture and bulk storage of liquid products, the manufacture and packaging of suppositories, the manufacture and packaging of ointments, the manufacture of glandular products, and for the production offices. Actually, this layout is no different from the layout than it was originally. Because of the expense involved in relocating these departments, the modernized effort on this floor was confined to the introduction of new equipment and methods.

The seventh floor in the original layout was used for packaging biological products which are processed just outside the city at the company's two-hundred acre biological laboratories. It is still used for the same purpose. Slight rearrangements were made on one end of this floor so that room could be secured for the storage of all biological packaging materials which formerly were stored on the ninth floor of the main building, thus establishing biological packaging as a completely consolidated department.

The original and present layouts of the seventh floor differ from what it would have been had it been possible

(Continued on page 291)

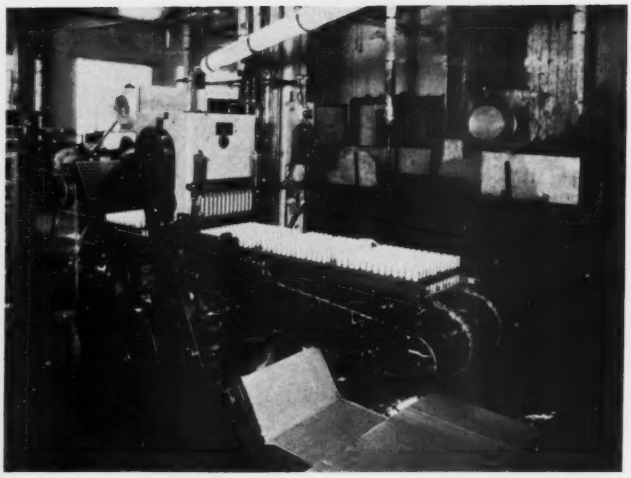
Above is shown the liquid packaging department before modernization, and below is shown the same department after modernization.

RESULTS OF

By HOWARD A. SUMNER

SOME weeks ago one of the important stockholders in our company was being shown through the plant. When he had nearly completed his trip, he suddenly stopped, turned to his guide, and said, "You certainly have a marvelous plant here. It is clean, well ordered, and it looks efficient. However, it must have cost a tremendous amount of money in the first place and the cost of maintaining it must be very high. We got along for fifty years without stainless steel, acoustic ceilings and all these glass and chromium gadgets in the scientific departments. Why do we need them now?"

That was certainly a fair question. It represents a conservative point of view and it is the first question bound to be asked by any board of directors when the management approaches it with a proposition contemplating the expenditure of large amounts of money for a so-called modernization program. However, back in the moaning thirties the bosses of a good many American enterprises decided that while business volume was low and prices of material and labor and machines were also low, that it was a good time to embark on an industrial rearmament



Above is shown the ointment packaging department before modernization, and below is shown the same department after modernization.

Above is shown the pharmaceutical research department before modernization, and below is shown the general chemical laboratory after modernization.

MODERNIZATION

Assistant General Manager, Norwich Pharmacal Co.

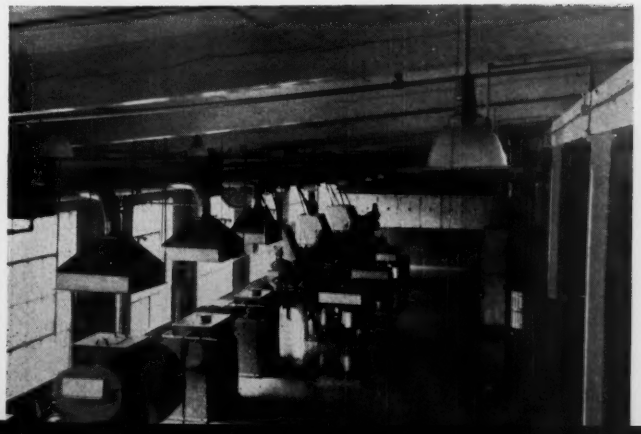
program and to so equip themselves that when the need arose they would be able to meet the demands of the times. One of the outstanding companies to follow such a policy was the United States Steel Corp., which spent many millions improving its plant and equipment and increasing its capacity at a time when the steel business was pretty weak. The events of the last few months have justified such action.

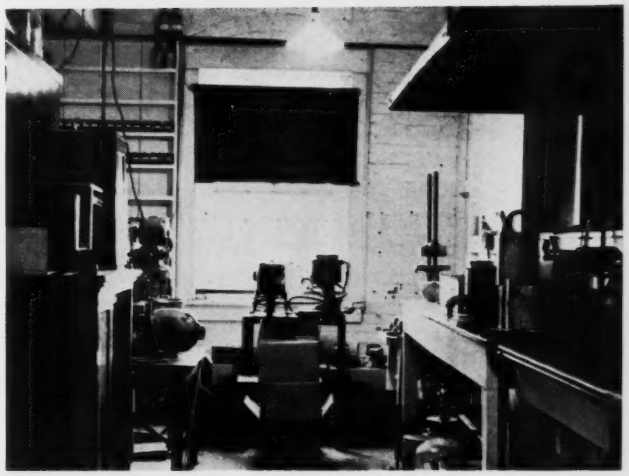
It was impossible five years ago to forecast the present demands of the defense program upon industry. However, it was possible to predict the development of tougher and tougher competition; to predict the need of new products and greater variety; to predict the upward trend in labor costs and in taxes and the necessity of a more flexible, more productive, more economical and more efficient plant in order to meet these conditions.

Recognition of the need for a major face-lifting operation on a business or industrial plant does not arrive suddenly. It generally evolves over a considerable length of time and because of

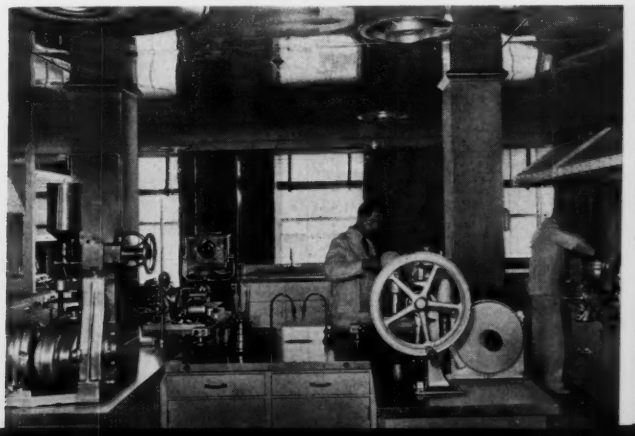
Above is shown the paper box department before modernization, and below is shown the same department after modernization.

Above is shown the tablet compressing department after modernization, and below is shown the tablet granulation and pill manufacturing department after modernization.





Above is shown the laboratory pilot plant before modernization, and below is shown the same thing after modernization.



many forces and ideas. Probably one of the most necessary factors in bringing plant management to see and comprehend the condition of their own plants is a competent, unprejudiced, frank and honest criticism by an outsider. This was true in the case of our company.

For some forty years our plant occupied the same site. Like all plants growing up over a long period of time, our factory became highly departmentalized. If a product was developed or a new line added, a new building was built to house that department or a new production line established. Improvements were made constantly, new equipment, new machines, new methods introduced as rapidly as they became available and economical and the result was a good modern plant—at least so we thought.

Then one day several members of our staff made the acquaintance of a consulting engineer who had imagination, aggressiveness, and wide experience. More as a matter of courtesy than anything else he was invited to look over our plant at Norwich. The net result of his visit was a considerable deflation among the members of our staff of their opinions of themselves and of our plant, and a realization of the fact that probably there was a great opportunity in many places to improve our equipment and our practices. So we hired him and an intensive study of the problem was started.

The more we studied the more opportunity for improvement became visible. At first we started looking at individual departments but we soon found that this did not produce the desired results. After considerable intensive work we found that, although the word "Modernization" is preceded in the dictionary by "moderation," it has nothing whatever to do with moderation nor with modesty, but rather, if a proper concept is to be arrived at and a proper program developed, it is necessary to think of the problem in terms of the whole plant and the whole business and in a bold inclusive fashion.

With this concept in mind a new start was made and when the picture was viewed as a whole, we found an appalling lack of integration. Packaging operations were carried on in eight different locations; drying operations in five parts of the plant; milling and grinding processes in three parts. A careful study of the flow of materials indicated the possibility of major savings but any attempt to solve this problem piece-meal merely resulted in an expedient which might be obsolete next year. Consequently, it was decided to develop plans contemplating a complete and what seemed at the time, radical rearrangement and reequipping of the entire plant.

The Time Study and Methods Department was put to work making work progress charts and studying every manual operation in the factory. The Engineering Department was called upon to study intensively all technical details and operations.

Our procedure was to picture the ideal facility for a certain production job and to develop a plan based upon that ideal and afterwards to reconcile that plan to existing conditions and limitations. Our engineers were given free rein to use their imagination and if a standard machine to perform a certain job was not available, they were encouraged to indicate what was needed to do the job as they conceived it. The result of this procedure was a headache to a good many machine builders but an opportunity to others. For example, in one packaging line it was decided that a certain operation must be performed at a speed of 120 per minute and in order to produce the quality of the product desired, the machine had to perform certain operations in a way different than had hitherto been the practice. The fastest standard machine was 60 units per minute. The unit wanted could not be obtained from any of the regular manufacturers of this type of equipment. However, upon contacting a machine manufacturer in an entirely different line, he expressed a willingness to undertake the development of the desired machine. This and similar experiences were repeated hundreds of times in the development of the plans. The result was the incorporation of many innovations and many new ideas in those plans.

After many months of intensive work, practical plans for the complete modernization of each department were completed. Then it became necessary to bring all of the many units together into one integrated whole. This involved some changes in the unit plans but in no case was it necessary to depart from the basic principles on which the plan had been developed. The next question was "What will it cost?" It is easy to imagine that the answer to this question was something of a shock to all concerned. As a matter of fact, considering the extent of the changes and improvements involved, the estimated cost was less than had been anticipated and when it was balanced against the estimated savings at normal plant capacity, it looked like a very good investment indeed.

The next move was to get an appropriation from the Board of Directors to cover the work. At this point it would have been easy to swamp the Board with a lot of detailed figures, blue prints and estimates which they could not possibly understand nor grasp, and it is quite likely that the appropriation would not have been forthcoming or it would have been authorized on a very limited basis. Instead of presenting such detailed plans considerable time and effort was put forth in preparing a series of charts, schematic plans and cross sections and other graphic data to permit a clear understanding of the problem and of the suggested solution even by those totally unfamiliar with the technical side of plant operations. First of all, the plan was divided into approximately three equal parts permitting the company to avoid making the full appropriation at once and before any real evidence of the success of the plan was available. The net result was that at the first presentation the plan was approved in general and a committee of the board was appointed to supervise its execution and to report back to the directors as the

work was completed and further appropriations were needed.

The factory organization now had the complete plan and the authority to put it into effect. This go-ahead was received in the midst of one of the busiest periods in the history of the company and the problem was to effect a complete rebuilding of the plant without interruption of current production. It was necessary to do still more planning. A master schedule was developed covering the work of modernization and from it detailed schedules covering each function involved in bringing about the many changes. These schedules in turn had to be synchronized with the production schedules in order to avoid any interruption in the flow of finished goods.

For example, the first step was to move the pill, tablet and coating departments from scattered locations in the plant to entirely new areas and to consolidate them into one department. The areas to which they were to be moved were occupied with crude stocks. The goods stored here were moved into temporary storage space and this was the only temporary move involved in the entire plan. A considerable amount of preparation work had to be done on the building and then at the scheduled time the first tablet compressing machine was moved from its old location to the new. All services and every detail were ready at the new location. The machine was shut down in the old tablet department and in less than one hour, it was in operation in the new compressing room. Not every unit was out of production so short a time, but during the whole period of modernization no unscheduled interruption of production occurred.

The close adherence to schedules was accomplished by assigning to one member of the engineering staff the sole duty of checking the progress of work in all departments, trades, and phases against the schedules. The minute that any job threatened to get behind schedule due to lack of materials, lack of speed, or for any other reason, it was brought to the attention of the plant management and immediately corrective measures were taken. Departments which caused the most anxiety in this respect were those departments devoted to office and clerical functions. We found it much easier to dismantle a rotary dryer, move it to a new location, connect it up with all the various services and get it back into operation than it was to move a comptometer and its operator a hundred feet.

Before the first phase of the plan was complete, it became evident that not only would the estimated savings be realized but that many additional benefits would result. Because of what was considered rather efficient, direct production methods, no great savings in this field had been anticipated. The greatest savings in labor were expected from reduction of indirect effort. The savings in indirect labor did materialize but somewhat to our surprise we also achieved many savings in direct labor operations. For example, in one department in which it was estimated that eighty-four girls would be required on direct labor operations, after about a year of operation, it was found possible to operate the department at a somewhat higher production level with seventy-one girls.

When a group of employees moved into a new department, a new spirit and interest on their part was immediately manifested. They seemed to take a great deal of pride in the innovations, in machines and equipment and they were anxious to demonstrate how effectively they could operate them. There soon arose a spirit of competition between crews on different production units. One crew on a packaging line having a maximum machine speed of 106 units per minute succeeded in operating that line over a period of ten days with an average production of 102 units per minute. As soon as this record was made known, the crew of one of the bottling lines caught the spirit and they immediately concentrated their efforts on making a similar record. The result was that each production unit in the finishing department is now constantly watching their overall average production and the team work exhibited in one of these groups in order to keep the production lines going is remarkable.

In their new surroundings the employees not only took a more lively interest in their work but with a little encouragement and some instruction they immediately commenced to take a great pride in the cleanliness and order of their work places. In the old days if a pill machine operator dropped a pill on the floor, he was likely to let it lay there and walk on it until it was swept up at the close of day. Under the new conditions if such a thing happens the operator will immediately pick up that pill or wipe up that little dab of powder which has been spilled. As a matter of fact, as this practice became a habit employees became more careful in their handling of materials with the result that there is not only more cleanliness but less waste.

As soon as the spirit of neatness and good housekeeping commenced to be evident, the employees started to be more careful about their personal appearance and this in turn along with the surroundings and interest in their work and work places, resulted in a snap and precision that is reminiscent of a military organization.

Of course the net result of all the above has been lower unit costs but fully as important as that has been the effect of the modernization program on the factory's ability to expand production quickly, to adjust itself to changes in products and methods and to accommodate itself without alteration of the basic setup to the many changes that occur from month to month.

Because of the extent of the modernization plan which covered not only production departments but warehousing, office and scientific departments as well, the work of putting the plan into effect was spread over a period of three years. At the end of that time some thought that there would be a period of quiet so far as plant changes were concerned but three years is a long time and new machines, new methods and ideas have

(Continued on page 301)

MODERN PLANT AND EQUIPMENT DESIGN

By ARTHUR MEGGETT
Industrial Designer

THERE are two criteria in judging the value of any building or piece of equipment; (1) does it work, and (2) does it please. The first, certainly, is foremost—the building must exclude the weather, the mixing machine must mix. But a man has certain psychological complexities which affect his attitude and aptitude and hence his personal efficiency. One of these complexities is his instinctive response to line and form and color—in other words to design. Man often thinks he can ignore an ugly sight. Ignore it he may, but avoid it he cannot, for ugliness—of sight, sound, or anything else—is enervating, while pleasantness is both restful and stimulating. These facts are inescapable; environment does make a difference. A teacher of stammering children, for instance, has found that their speech tends to be much clearer in a simple and orderly room than in one filled with bric-a-brac. Office workers concentrate more effectively and with less fatigue in an office in which the racket of typewriters has been reduced by sound absorption materials.

Visual "noise" is similarly wearing on the nerves. Why, then, do we tolerate so much of it? The reason for our lazy tolerance is that sight is not as insistent as sound; it jars the subconscious rather than the conscious. But it is the subconscious that controls a worker's emotions and hence his performance. Ugliness is due historically to the fact that technique—engineering—has only within a comparatively few years realized the great economic value of good design. Engineering and art have at last begun to work together.

Labor—especially repetitive labor—is always more or less difficult, but it must be performed because man has no alternative. Since labor is difficult, the worker needs prodding to get to it and stimuli to keep at it. By making environment pleasant for the laborer his work is made easier. He works better because he feels better. This is not sales talk. It is an indisputable fact that emotional irritations affect output as was shown by the recently published scientific studies conducted at the Hawthorne plant of the Western Electric Co.

The goal of engineering is to achieve the greatest possible planal, mechanical and structural order. The goal of design is to achieve the greatest possible visual order. The success of the latter hinges upon the success of the former, indicating the theory that the perfectly engineered building or machine does not inevitably require the attention of the designer.

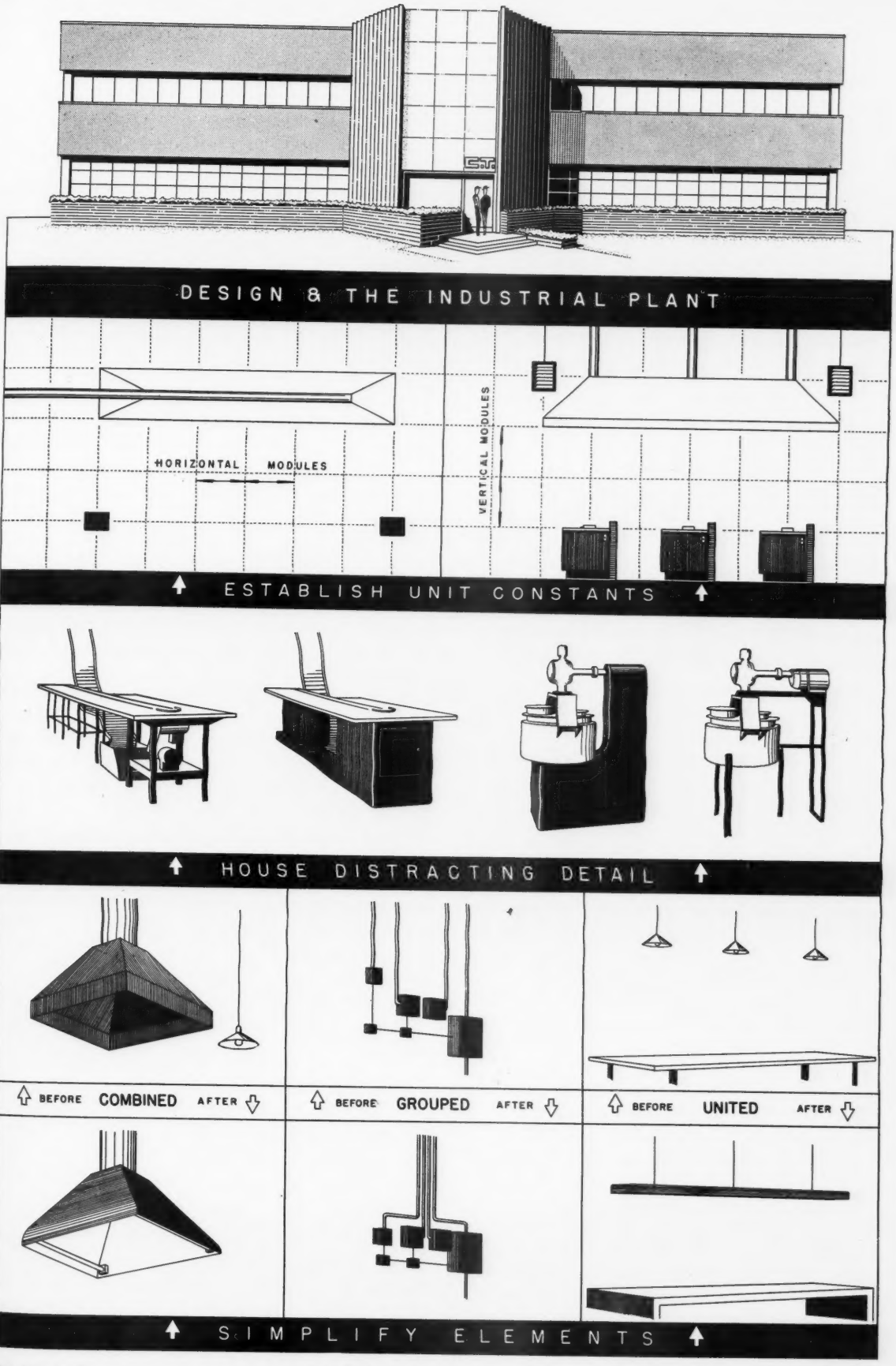
This is only theoretically true because no object is perfectly engineered, because engineering can offer structural alternatives, one of which will be visually more pleasing than the other, and because design uses tools—mass, line, proportion, color—which are beyond the scope of engineering. Nevertheless, honest design develops from and is intrinsic in the mechanico-structural organization of the object. The goal is visual order that makes sense in terms of structural order.

Visual order involves two factors: The first, simplicity, which is the elimination of the superfluous, and the second, integration, which is a matter of coordination and continuity, streamlining in the non-technical sense of "eye flow"; establishing a relationship of parts to each other and to the whole which allows the object or objects to be seen as an ensemble instead of a jumble.

The ideal industrial plant design problem, from which the most complete visual order will be obtained, is one in which the exterior and the interior of the plant are designed together, one in which compromise is not necessitated by the utilization of existing structure and equipment. Such freedom should result in a completely coordinated solution—a visual unification of building, fittings, machines and equipment.

When such freedom is impossible, modernization is the sensible compromise; replanning, rebuilding and replacing existing structure and equipment within the limitations of the budget. It would be quite irrational to forego improvement simply because complete perfection may not be obtained.

Whatever the degree of modernization involved, it is primarily the production engineer's problem to organize space, and to direct the flow or routes of product,


DESIGN & THE INDUSTRIAL PLANT
HORIZONTAL MODULES
VERTICAL MODULES
ESTABLISH UNIT CONSTANTS
HOUSE DISTRACTING DETAIL
BEFORE COMBINED AFTER
BEFORE GROUPED AFTER
BEFORE UNITED AFTER
SIMPLIFY ELEMENTS

power, waste, and workers. It is not the designer's province to interfere with this organization, but rather to work with the engineer to obtain visual emphasis of these routes and areas and to organize aesthetically the equipment involved in them.

This requires attention to the design of individual units as units (machines, tables, lighting fixtures, etc.); to their design as members of a group of units (a group of tablet compressors, a packaging line); and finally to the design of one group of units in relation to other groups (tablet compressors to lighting fixtures), and to the shell of the structure (to walls, windows, etc.).

The Functions of Form

The establishment of certain "unit constants" will aid in the visual organization referred to above. One approach is the use of horizontal and vertical modules for the location of building accessories such as unit heaters and lighting fixtures, and of power lines, outlets and switches. Some of these are usually spaced on equal centers as a matter of course, but more regularity of pattern can be obtained if as many elements as possible are related to a modular dimension. This may lead to some technical economy, such as the use of standard lengths of pipe and conduit. There are practical limitations to the modular dimension, however; it cannot be used too arbitrarily.

An especially important unit constant is a standard working height. This will help to provide visual unity, even where the working surfaces are not joined as in a production line. Standard toe spaces, baseboards and dados are other constants.

Diagonal lines are visually lines of movement, and can be distracting to the eye if not carefully handled. One of the most distracting elements in factory equipment is diagonal bracing running at a variety of angles. Where diagonals are necessary it is well to establish a constant angle.

A further step in visual organization is simplication of forms, for which there are three general methods; each is illustrated in the diagrams.

The first is to combine elements—to combine various functions into one form, for instance, the combination of lighting and dust hood puts two elements into a single form.

The second method of simplification is by the grouping of elements:—conduit lines can be grouped instead of haphazard, and the fuse boxes arranged on a back ground panel.

The third method is by the unification of elements; viz., instead of several lighting fixtures over a table, use a continuous reflector. This might use tubular or fluorescent lighting; or if work is done intermittently at various parts of the table, lamp units could hang from a track in the reflector and thus be easily moved to any desired spot.

The "streamlining" or housing of equipment is a combination of all three of these methods. While good design is far more than a mere matter of concealment, housing is a simple and relatively inexpensive means of reducing the visual detail of complex equipment. At the same time, it eases maintenance, and reduces noise from the machinery enclosed—especially if the inside surfaces of metal housings are coated with a sound absorption material.

The standard working height mentioned above can be used as the top of a "visual" base, extending from the floor. Visual "weight" can be given to this base by uncomplex masses of housing. In general, it is more valuable thus to house elements below the working surface than above, since the angle of sight tends to be down rather than up. Distracting detail within the periphery of vision is eliminated, and the eye will tend to rest on the working level.

To fix the eye of the worker on the important part of the machine, it is desirable to house all but those moving parts which perform the actual operation. This is more relaxing for the worker and it facilitates concentration on what is important. There is an interesting example in another field: a mid-western railroad ascribes a large part of the popularity of one of its steam trains over a diesel competitor to the fact that the moving valve gear, rods and drivers (emphasized by streamlined housing of the rest of the engine) are exciting and interesting, and have helped to give the train a personality.

There are further suggestions in regard to housing: while fixed and portable equipment should be designed in terms of mass, such items as stools, which are lifted by hand, should be linear to emphasize their lightness. Since curved lines suggest motion, moving parts of machinery might well be in round or curved forms, with static parts rectangular. This does not apply to naturally round forms such as tanks.

Metal is the usual material for housings; asbestos cement board might also be used. While polished metal does suggest cleanliness, its high reflectivity is not easy on the eyes; in cases where spillage is not a factor the dull surface of an asbestos cement board, obtainable in colors, would prove more restful—particularly on work tops.

Still another excellent table top and housing material is formica which is available in dull or glossy finishes through a wide range of colors. The dull finish cleans easily and will not show scratches.

Although the organization of space in the factory is the production engineer's problem, the sense of space can be ordered by the designer. For instance, in a very large area the worker can have a sense of being lost and insignificant. More definite enclosure of areas would give the worker a sense of scale. This suggests the use of screen walls, not necessarily extending to the ceiling. They would not interfere with production since they would not project into the aisles and would be without doors.

Housings and screen walls should, of course, be detailed for easy movability and high salvage value, to retain flexibility of plant layout.

The Functions of Color

Generalization on color harmony is a complex matter beyond the scope of this article, but color is an effective tool for determining several very practical conditions.

I. Color and light:

A low degree of natural light will limit color selection, especially for walls and ceilings, but if there is a large amount of natural light, the percentage of light reflection of a color is not so important. In general, of course, the more light the better.

White is the best light reflector, but for reasons which will be given later, it should be confined to the ceiling, which is generally out of the line of vision.

II. Restfulness, stimulus:

Work rooms should be colored to keep the worker alert without fatiguing him. Lounge and lunch rooms, on the other hand, should be keyed for restfulness. Even in work rooms, large areas of color should be generally restful, with stimulus provided by brighter colors on important details at working spots. Parts that require constant watching, however, should not be over-stimulating or fatigue will result.

Restfulness should not be confused with deadness. A colorless interior can very easily border on the depressing; unrelieved gray is serious and solemn. On the other hand, such colors as orange, green, blue, which can be frightful in pure tones on a large area, can be very pleasing if toned with gray.

Color may be used to reduce visual detail. It should be utilized together with form to establish the visual base previously discussed. And in areas where there are a number of machines unconnected by conveyors or tables—a compressing room, for example—a degree of unification may be obtained by painting the floor areas around groups of machines differently than that of the aisle areas. The difference might be one of color with approximately the same value, or it might be a difference in value of the same color.

Exposed panels on which are hung tools or machine parts can be painted in a hue or value that is not too different from that of the tools, rendering the panel visually more of a single tone than a mass of spots.

III. Legibility:

Strong colors, black, and white should not be used for backgrounds such as work counter tops. Strong colors are too fatiguing, black is indefinite, white is monotonous and reflects too much light into the eye. Light backgrounds tend to cause halation and loss of detail; for instance: the detail in a medium gray object seen against a light background will be lost to the eye because the retina must "stop down" due to the high average amount of reflected light. Place the object on a dark background and the retina will open up because of the lower average amount of reflected light, and the detail will be visible. The color selection for work counter tops depends on the color of the product—contrast is necessary. Purple is a generally good color because it is neutral and definite.

IV. Color and apparent temperature:

Equipment in hot areas such as extraction departments should be painted in cool blues or greens. Walls, on the other hand, if painted in dark colors will absorb more heat.

V. Stimulation of cleanliness:

There are two approaches to the problem of cleanliness; one is to paint so that dirt will not show—the sweeping under the rug method—and the other is to use colors on which dirt is apparent. Workers are more apt to keep such surfaces clean. The Norwich Pharmacal Company painted a strip of aluminum at the juncture of wall and floor; better maintenance resulted.

VI. Identification:

As with visibility, color for identification means contrast. Portable equipment may be more quickly located if painted to contrast with fixed units.

To help all workers understand equipment and at the same time to add variety, different production lines in a room may be colored differently or in varying values of the same color.

Pipe and conduit lines can be more easily traced if identified with color, either by painting the whole line or with colored bands at intervals. A report of the National Safety Council of the A.S.M.E. recommended the following: red for fire-protection facilities, yellow or orange for dangerous materials, green for safe materials, purple for valuable materials.

As a safety measure, paint switches and levers of various types in various colors, keeping the same color for the same type of switch or lever throughout the plant. Dangerous moving parts should be accentuated with color.

The Economics of Good Design

Design suggestions such as those made above are necessarily limited, since each problem demands individual analysis. And again, design is inseparable from planning and engineering. Order of form and color requires study in drawings and models, with every consideration for practical details. The end result should appear simple and natural, but such simplicity is seldom obtained without effort. Design is not or should not be a matter of making an inexpensive object look expensive; design does not imply ostentation, nor does it necessitate elegance. The criterion is not expense but visual pleasantness, and visual pleasantness involves simplicity, and simplicity is (or can be) inexpensive to achieve.

If this final design—this pleasantness—involves an initial cost, consider the return:

Neater, better workmanship: a neat environment stimulates neat workmanship; the elimination or reduction of visual detail focuses the attention of the worker on the work; proper color and light reduces eye strain.

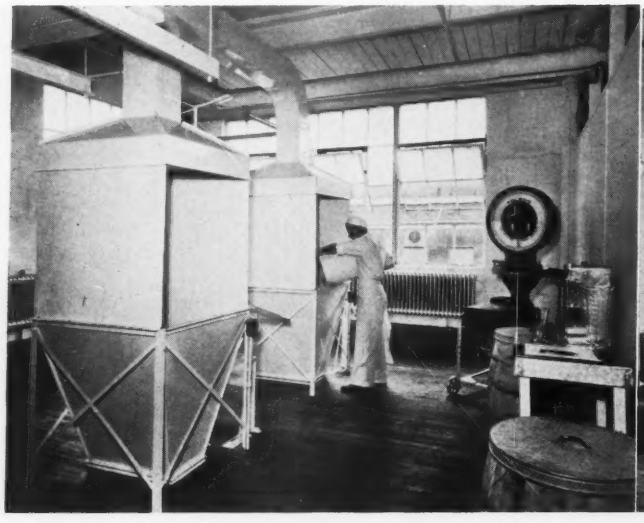
(Continued on page 313)

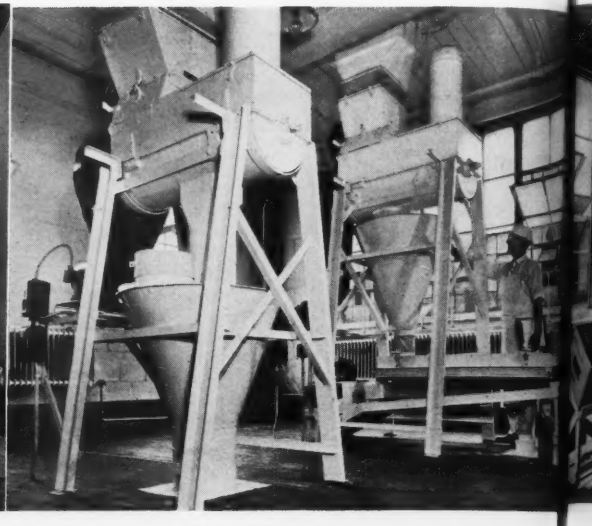
MODERNIZING

By R. CROSBY COUGHLIN

View No. 1 below shows loading hoppers and dust control hoods.

View No. 2 below at the right shows the mixing and sifting equipment located on the floor below.





A SMALL plant should be modernized in such a way as to prevent repetitive modernizations. By this is meant that the small plant should establish an efficient nucleus which can be expanded in a logical, integrated manner to handle expanding volume without confusion and without being forced to overhaul its facilities periodically in order to be able to meet increased productive requirements. A small plant has even greater need of efficient methods than a large one for the reason that its capital available for permanent investment may be limited, and its working capital must be kept fluid in order to do all that is necessary to expand sales. Its working capital cannot be kept at maximum unless its production costs are kept at minimum. It must be remembered that in this highly competitive trade the smaller plant is brought into direct competition with the largest firms in the industry and hence its dollars must be made intensely effective. For these reasons the small plant needs an efficient layout, and equipment as efficient as can be obtained consistent with the amount of money it may invest.

Clark-Cleveland, Incorporated, are the manufacturers of Fasteeth, Alkaline Denture Powder, and Kleenteeth, Scientific Denture Cleanser, both products in powder form. A year ago we were faced with a problem which undoubtedly is a common one to small but rapidly growing businesses in the drug field; namely, the problem of how best to lower our operating costs and expand our production. A brief outline follows describing our former manufacturing, packaging, and handling operations, and the disadvantages of that system which were apparent after thorough analysis.

The mixing and sifting equipment was located on a floor above the filling machine. The various ingredients were placed directly into the loading hopper of the mixer. To do this it was necessary for the operator to carry comparatively small batches up on a platform. This entailed a great deal of unnecessary time and labor. The only means of dust control in the mixing room was a large exhaust fan, which lessened but by no means overcame a very annoying dust problem.

After the ingredients had gone through the mixing and sifting and screening operations, the product passed into the hopper of the filling machine located on the floor below. Here, again, in the filling process, adequate dust control was lacking.

The cans were then placed on a conveyor and passed along to the operators who handled the capping and packaging operations. The conveyor table that was then used was not long enough to enable a completion of the packaging operation, making it necessary to place the unit boxes, each holding a dozen packages, into bins for packing into shipping cases at some later date, making considerable additional handling. There were many and sundry inefficiencies in the various operations which are not outlined above, which became apparent after a very thorough analysis was made of our production problem.

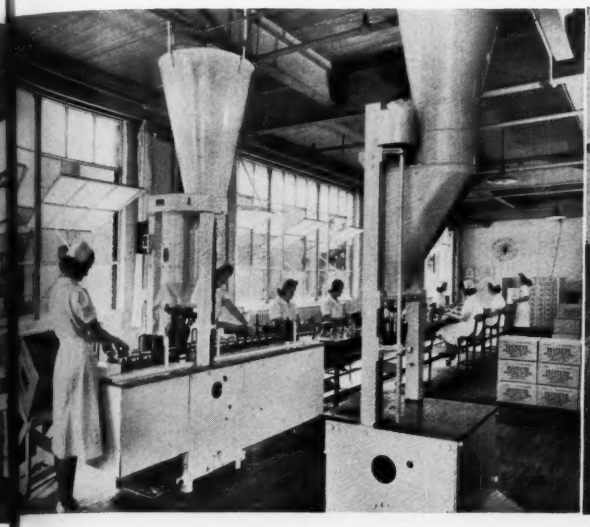
Since it is a common practice for the accounting or legal department of most businesses to employ the

THE SMALL PLANT

Vice-President, Clark-Cleveland, Inc.

View No. 3 below at the left, shows a new automatic filling and capping machine.

View No. 4, directly below, shows a portable, stainless steel conveyor serving alternately the two filling machines.



services of outside counsel, we deemed it advisable to follow the same course with our production problems so as to solve these problems in the best and most economical manner and at the same time prepare for future increased production. We engaged the services of a well-known production engineer to make a survey and draw up needed specifications for modernizing our plant. In this regard it can be stated that this was a very profitable step because of the efficient manner in which we now are able to utilize old as well as new equipment and because of space and labor savings. We have the same size plant we had formerly. With the right layout and with very little new equipment we were able to triple our previous capacity. Our savings have within a single year more than equalled our entire modernization investment.

Description of New Set-up

Picture No. 1 shows loading hoppers and dust control hoods. This equipment facilitates the making of much larger batches, with much less labor, and in a dust-free atmosphere.

Picture No. 2 shows the mixing and sifting equipment located on the floor below. These machines are controlled from either floor by magnetic switches. It was not necessary to purchase any new equipment in the manufacturing, mixing, sifting, or screening operations, but merely make proper readaption of existing equipment.

Picture No. 3 shows a new automatic filling and capping machine and also a semi-automatic unit. A very effective system of dust control obviated the necessity of any enclosure around the filling machine, and affords a completely dustfree filling operation.

Picture No. 4 shows a portable, stainless steel conveyor serving alternately the two filling machines. This conveyor is thirty feet in length and affords ample space for completion of the packaging operation.

At the end of the conveyor, shipping cases are wire-stitched and the sealed cases are placed on skids and brought to storage by a lift truck. Open stock for odd shipments is placed right from the end of the line into specially constructed stock bins on steel legs, which bins are easily handled by a lift truck, thereby eliminating many needless rehandlings employed in the past.

A new chemical laboratory was efficiently laid out for adequate raw material analysis, finished product control, and research.

No pictures are available of the previous layout and setup which would show more effectively several general improvements in production such as smoother, faster, and more systematic flow, more economical use of space, more systematic handling and storage and other distinct improvements affording ease in keeping the plant clean and dust-free.

Our experience has proven that not only does it pay to modernize but any modernization plan should not be undertaken without, first, a thorough analysis of present

(*Continued on page 313*)

MODERNIZATION AT MERCK & CO.

By R. H. BUTLER, Industrial Engineer

In any modernization program mere cost reduction need not be the sole motivating force. Better working conditions and improved product quality alone justify such a program. It was these factors plus a need to utilize space more effectively which prompted Merck and Company to undertake an extensive modernization program.

This company manufactures and packages chemicals for a variety of uses. Very few of these products go directly to the ultimate consumer, but rather to pharmaceutical, industrial, and automotive distributing houses; and to research, analytical, and educational laboratories. Its manufacturing includes thousands of chemicals, each of which is packaged in several different sizes. Therefore, it has extensive small-lot operations in storage of bulk, stocking of containers, packaging and shipping of all these items.

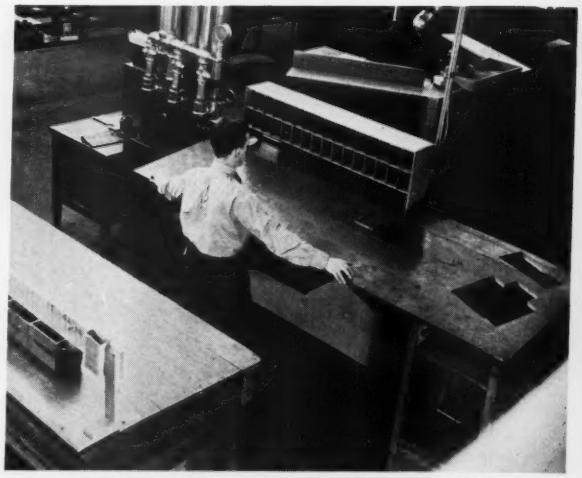
The Warehouse

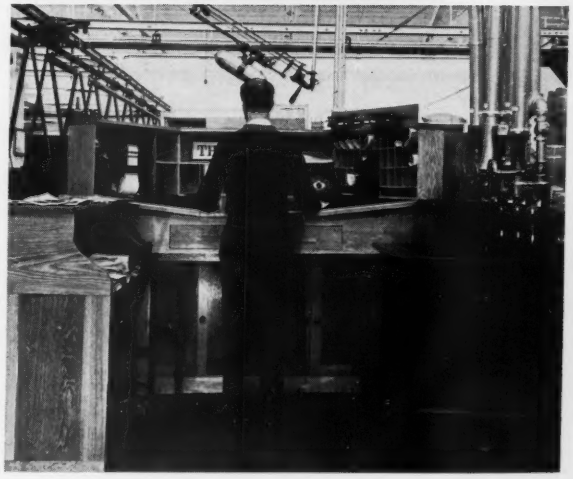
In the Receiving Department, the "checking in" from the factory and sorting of so many items presented a serious storage space problem. When lots of 3 to 10 barrels were stacked on the floor, the entire space above was lost if these containers were to be kept readily available. Some type of rack was needed to utilize the full storage heights and yet permit the lower items to be "pulled from under." Weights range from 100 to 500 lbs. per barrel.

The market was investigated for standard fixtures which might be used. The only ones found which would support the weight had so many vertical members as to create considerable wasted space and difficult handling. The decision was in favor of a custom built job.

The design finally engineered, consists of cantilever-type racks with a row of vertical supports on the center line, between two rows of barrels, with the operating or aisle sides completely unobstructed. The cantilever arms support four steel shelves, one above the other, with surfaces so smooth that heavy barrels may slide, instead of roll, from the shelf to the platform of an electric lift truck. The racks were designed to make use of such trucks, which have elevating platforms capable of lifting barrels to a height of ten feet.

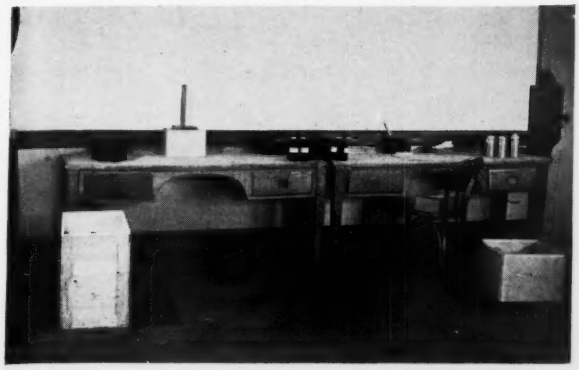
The combined use of these racks and trucks modernized storage and handling methods to such an extent that what seemed to be inevitable building construction was averted. It also created a more systematic standardization of stock locations making possible a more rapid turnover and permitting quicker selection of chemicals from bulk stock to allow close planning of production. Special orders for odd weights or unstocked finished items may be worked in the schedule without confusion. This, together with labor savings, amply repaid the investment.



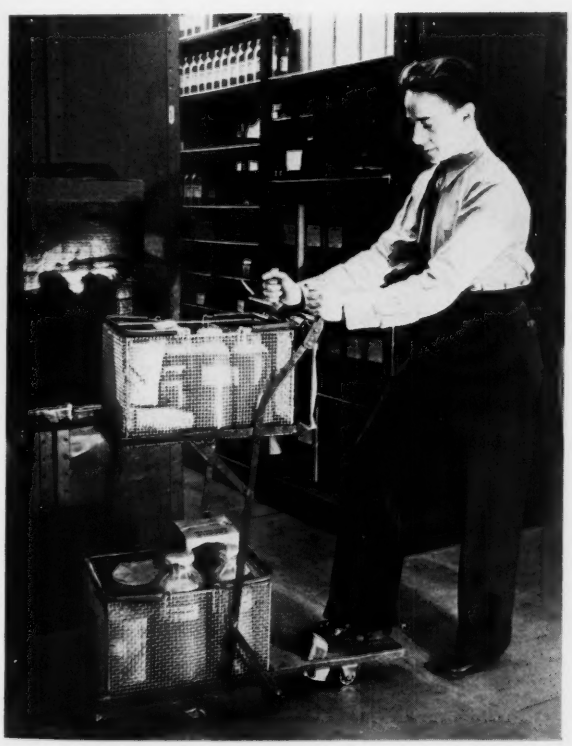


The old dispatcher's bench in the Shipping Department is shown at the top, with the new dispatcher's bench directly above.

At the top right on the opposite page is shown the cantilever bulk storage racks in the Receiving Department. Below this is a general view of the Subdividing and Finishing Department. And at the bottom is a general view of stock shelves and the monorail system in the Shipping Department.



The old labeling and wrapping set-up is shown at the top, with new one shown directly above.



Above is shown the order filler's scooter and J. Cassio who suggested it.

The Packaging Department

In the Packaging Department, the company policy of offering a complete line to the customer causes small lot-weighing by hand in sizes ranging from less than an ounce to five pounds. These lot sizes were classified approximately as follows: more than 3,000 pieces; 3,000 to 500 pieces; 500 pieces or less. For lots of 3,000 pieces and up the material is handled on more or less conventional packaging machinery. The other two classes are hand-weighed. The first of these to be described is the class of 500 pieces or less. As in the Receiving Department, space in the packaging department was at a premium.

Each weighing operator's bench was formerly 8 feet long and 2 feet wide. The open bulk barrel was on the floor at the right end. Just above and on the right end of the bench was the scale. Box trucks, the depth of which extended from bench height to casters on the floor, were used to bring empty containers from the Supplies Department. From these trucks the operators lifted as many empty containers, as two hands would hold to the bench until it was covered, except for the space occupied by the scale. Each trip to the box required a back-bending motion creating much fatigue.

The operator scooped goods from the bulk barrel to the scale, and, when the correct weight was recorded, poured it into the empty containers on the bench. As the containers near the scale were filled, the transports to others became longer until the bench was covered. It may be seen that three obviously fatiguing operations were present,—the bending over into the box truck to fill the bench with containers, the bending into the bulk barrel to fill the scoop with goods, and the steps taken to fill all containers covering the bench. In addition to the weighing difficulties above, the workplace required for the barrel, bench, and box truck was very large.

Under the old setup, the deep box truck loads of filled containers had to be rolled to an entirely separate department to be labeled and wrapped. Here were similar large and space-consuming benches and the same back-bending motions of unloading the box truck to fill the bench with containers, and reloading finished items for delivery to the stockroom. Finishing supplies were kept in ordinary drawers with no special partitions for holding sizes and shapes peculiar to the operator's particular type of work. When it was necessary for an operator to move to another bench, these drawers had to be unloaded and the operator's special tools and supplies carried to the new location in handfuls and armfuls. If she stayed at the same bench, considerable material handling was necessary to get the work to her.

The new weighing workplace has a bench only two feet square. The empty containers are rolled up to the bench on a shelf truck 20 inches wide by 48 inches long with the long dimension next to the left side of the bench. Truck and bench are of equal height. The truck may be pulled forward on its casters so that first the front, then the middle, and then the back end is within the normal working area. On the right of the small square bench is mounted a bench tray or open hopper from which the material is scooped from normal working height instead of bending into a barrel. The bench holds the scale and bins for container covers. Containers may be filled on the truck in which they were delivered, which has now become part of the work bench or work area. This same shelf truck is rolled across the aisle to a finisher who labels and wraps the bottles, working across a similar bench two feet square to another truck. To maintain the mobility of the finishing force, each operator is supplied with a small cabinet on casters in which she keeps her personal tools, adhesive supply, and all accessories peculiar to the type of work in which she is skilled and on which most of her hours are spent. These cabinets are so designed that they may conveniently be rolled out of the way under the small bench. Thus an operator may be moved to another bench in the room without making several trips with hands full of loose apparatus. Formerly these finishers also used a long bench requiring a large work area. For both weighers and finishers the loading and unloading of containers to bench were eliminated by the shelf trucks. The same trucks finally carry the packages to the stock room.

Because of the reduction in operators' workplace areas, the weighing and finishing departments were combined in one floor area amounting to only one-half the former space.

The steel shelf trucks used in the improved packaging methods were obtained as a by-product of improved methods in the Shipping Department, which is treated in later paragraphs.

For the class of 3,000 to 500 pieces, a special setup was designed with weighers' positions, of the same small type and the same open hoppers, on each side of a conveyor belt. As the operators weigh and fill the containers, they place them on the belt from whence they go to a machine-labeling and finishing conveyor table outside of the dustproof room in which the weighing is done. Machine labeling and wrapping is economical on lots of this size even though machine-weighing is not.

The Shipping Department

The Shipping Department order filling unit contains an extensive group of steel shelves on which is stored loose stock comprising a current supply of each of the items in the complete line. The selecting of stock for orders necessitated much traveling in and out among these shelves, which was done on foot.

As the containers were brought from the shelves they were placed on the steel shelf trucks, mentioned previously in connection with the Packaging Department. These trucks were pushed along the line formed by the ends of the rows of shelves as the order-filling clerk rounded the end of a row to go into his next necessary aisle. The trucks then went, first to a group of checkers,

(*Continued on page 305*)

Modernization at Sharp & Dohme

(*Continued from page 277*)

to effect an ideal layout. The ideal layout would have centralized the chemical stocks between the liquid manufacturing department at one end of the building and the tablet granulation, pill mass and powder manufacturing departments at the other. Thus, 95% of all the formulas weighed out in the chemical stock department would have been delivered on the same floor to the stated manufacturing departments. However, as we have already pointed out, the modernization layout achieved substantially this by placing the chemical stock on the fifth floor where it is on the same floor with the tablet, pill, capsule, and powder making departments and directly under the liquid, ointment, and suppository departments.

In the original layout, the eighth floor was used in part for the general offices, for chemical stock, and for the extract manufacturing department. In the modernized layout, this floor is used for the extract department and for the general offices, the necessary expansion of the general offices having taken over the area vacated by the chemical stock department.

Similarly, the ninth floor in the original layout contained the analytical, hexyl resorcinol laboratories, drug moistening, sales and advertising offices, and packaging material storage. In the modernized layout, the analytical and hexyl resorcinol laboratories remained where they were. Packaging material storage was removed to the fourth floor adjacent to the consolidated packaging department and the sales and advertising offices remained, with some additions, as they were formerly. In the ideal layout all offices would have been consolidated on the ninth floor. This would have had some functional advantages but the operation of the sales and advertising offices separate from the administrative and general offices in the modernized layout creates no appreciable disadvanatge.

It will be seen from the foregoing comparison that it was possible to achieve through the modernization program almost an ideal layout insofar as a multi-story structure will permit.

The effect of the modernization layout on operating costs may be visualized by following through the building one or two of the more important items. In the original layout, crude drugs were stored on the third and fourth floors of the annex. Milling was done on the second floor and the ground product was weighed and bagged off on the first. This bagged product was then carried on trucks into the main building and up the elevators to the ninth floor moistening area. In this area the moistening mixers were equipped with a belt conveyor to carry the sacks of ground material up high enough so that they could be dumped directly into them. The moistened product was then discharged into small buggies which were pushed over loading manholes in the floor leading to the percolators on the eighth floor below.

In the modernized setup, the crude drug is taken directly to the ninth floor and put in storage. The various mills were mounted on a mezzanine under which moistening mixers were hung. Belt conveyors leading from loading boots sunk into the floor to the mills on the mezzanine were installed. The loading boots, the mills, and the mixers were all connected with a high velocity dust collection system. Adjacent to the loading boots, a floor scale was installed. Under the present system, the original bales of drug are taken out of storage and the gross weight is determined by means of the floor scale. The bales are then broken open on the floor and fed into the loading boots. The sacks or bagging and foreign matter (such as stones!) are weighed and the net weight of the drug to be ground is thus determined. Conveyors carry the crude drug up to the mills which in turn discharge over magnetic pulleys directly into the moistening mixers. These are fitted with menstruum pipes so that the drug can be moistened. After an appropriate mixing interval, the entire charge of moistened drug is discharged into a portable buggy large enough to take an entire mixer load. The economy effected by this change is indicated from the fact that fourteen men were required to operate the old mill and four are required to operate the new.

In connection with the distribution of raw materials such as chemicals of various kinds, the old versus the new flow lines are illuminating. In the original layout, chemicals were carried to the eighth floor and put into stock. Incidentally, the barrels were not mounted portably so that the weighing of a particular formula required at least two trips to each barrel of material. As stated above, 45% of the formulas were then taken down on the elevators to the tablet department on the fifth floor. Certain of the materials for the manufacture of "S.T. 37" antiseptic solution were delivered all the way to the first floor. The remaining part of the output of the chemical stock department was delivered respectively to the sixth and to the third floors where "Bo-Car-Al" powder was manufactured.

A typical packaging operation required material, which had first been taken to and stored on the ninth floor, to be delivered to the sixth floor in some instances; to the fifth floor in others; to the fourth floor in the larger number of cases, and, in some instances, to various areas on the third, second, and first floors. In the present setup, packaging materials are brought to the fourth floor of the annex or to the fourth floor of the main building and put into storage. They are delivered to the packaging department located between the two packaging storage areas on the same floor and from that point the finished product is conveyed to the floor below.

In conclusion it may be said that the rearrangement of the several departments and the introduction of new equipment and methods resulted in very substantial economies. Moreover, service to customers has been accelerated, quality control enhanced, and working conditions in general improved.

MODERNIZING FACTORY

By ROBERT C. McCOLLOM
Landscape Architect

IN RECENT years more and more attention has been paid to aesthetic elements in the design of factories. There are several profitable reasons for this which I shall discuss in this article. The field of landscape architecture embraces far more than the mere planting of shrubs and bushes. These are but the materials with which we work. It also involves, in cooperation with the architect and engineer, the placement of the building or buildings, layout of roads, walks, etc. The landscape architect will even have something substantial to contribute as to adaptability in the actual selection of the site. The time for the landscape architect to be commissioned is when the architect starts on his plans so that the whole job may be evolved as a unit giving great attractiveness and maximum efficiency. This is much cheaper than the correction of errors later. But, as will be shown later, a landscape architect can ameliorate past errors in architecture through effective screen planting. He has as much to contribute to the modernization of an old plant as he has to the establishment of a new one.

In connection with new building projects the landscape architect can make several invaluable contributions. First, he can secure efficiency of operation by insuring as unhampered a flow of materials and traffic outside the building as the production engineer attains within. Here is where proper placement of buildings in relation to their functions, proper connecting roads, loading areas, parking fields, etc., come into importance. The landscape architect by fostering ease of movement and attractive surroundings produces efficiency of operation and safety of workers. This is not theory, but is a proven fact in actual cases where remodeling was done and records kept.

Second, the work of the landscape architect improves the morale of the workers by providing proper external surroundings and a pleasing outlook.

Third, the landscape architect can enhance the advertising values inherent in well kept and attractive grounds by using plants which symbolize the products made in the factory. This is especially true in cases where factories adjoin main railroad lines or arterial highways.

The cost of landscaping is comparatively so small that no well informed plant manager would fail to take advantage of all that good landscaping contributes to the morale of his workers and to the appearance and operation of his plant. It is impossible intelligently to discuss how to solve the problems of building placement, road layout, parking fields, etc., because these are individual with each factory and consistent with its particular site and purposes. In solving these problems the landscape architect has to offer his knowledge of distribution of space, his training in automotive circulation, and his sense of the distinction between what is merely aesthetic and what is strictly utilitarian.

It is possible, however, to set down some general rules regarding the planting of factories. In the first place we must not lose sight of the fact that a factory is a building whose entire purpose is utilitarian and whose exterior should express this if the architect has been sincere in his treatment. The landscape architect is duty bound to continue this general effect and feeling. This dictates formality in the treatment of the surrounding area. But formality does not necessarily mean perfect symmetry, clipped plants, and boring perfection of detail. It rather suggests a feeling of restraint and dignity. This is best accomplished by the use of a few well chosen, and well placed matured plants rather than an attempt at the picturesque or pretty. Effectiveness is gained by the power and strength of the planting.

One of the things which should never be done—see illustration—is the so-called foundation planting, which is a heterogeneous collection of evergreens forming a continuous band of planting across the entire facade of the building. These grow fast, crowding the building and each other, are forced upward cutting out light and air from windows, and in general create eventually a messy, chaotic effect which is far from satisfactory. We must consider not only the present but the future. Far more money is misspent, not well spent, making changes and repairs to landscape work. Farsight and knowledge of eventual plant sizes is an insurance against mistakes.

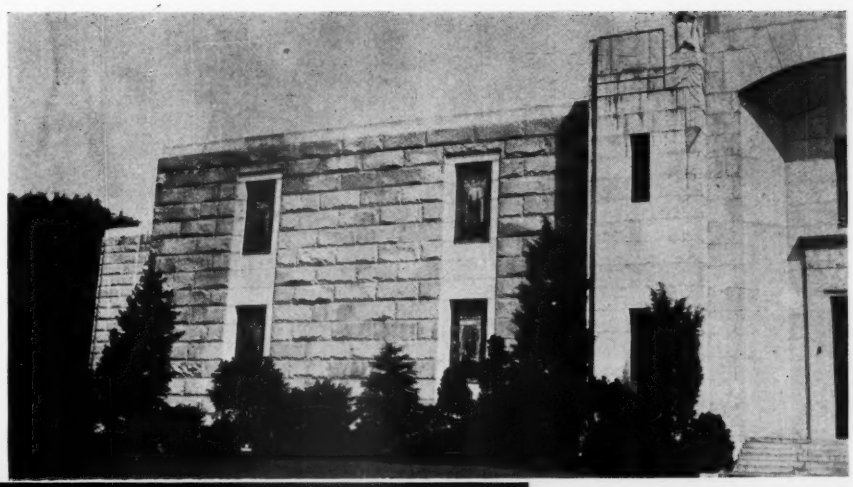
Planting can be used to advantage to hide towers, storage tanks, railroad sidings, bins, etc., important to the operation of the plant but offensive to the eye. By the same token, planting may be used to accentuate attractive views which may be lost in the general confusion unless properly framed and forced upon the attention.

If it is at all possible planting which in some way typifies the industry involved should be used. In the cosmetic industry this can be done quite effectively because the extracts of a great many fine landscape plants are used in various branches of this trade. Cosmetic factories may use for decoration such plants as jasmine, tuberose, lavender, lilac, geranium, honey-

(*Continued on page 300*)

SURROUNDINGS

To the right is shown typical foundation planting which is an example of what not to do today.

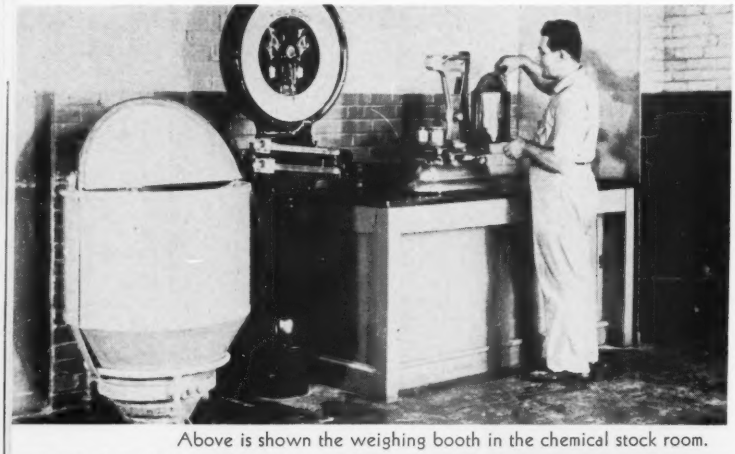


Above is shown the modern plant of Northam Warren Corp., Stamford, Conn., exhibiting symmetry and balance of planting.

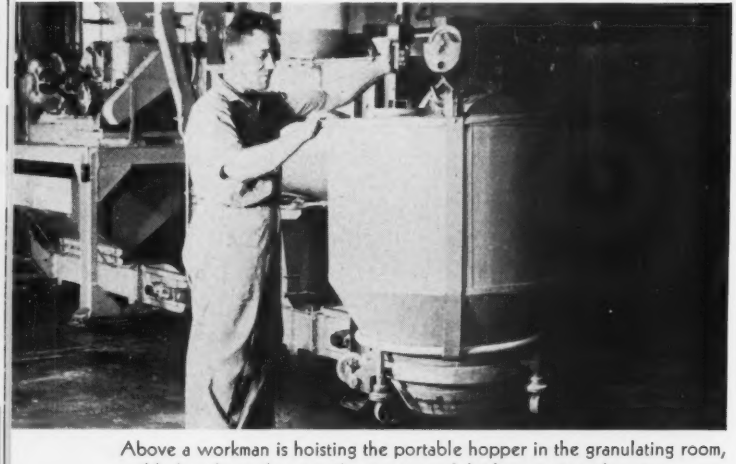
View at the right indicates that nothing makes a building fit into its surroundings more than one or more matured trees nearby.

MODERNIZATION: SIX YEARS AFTER

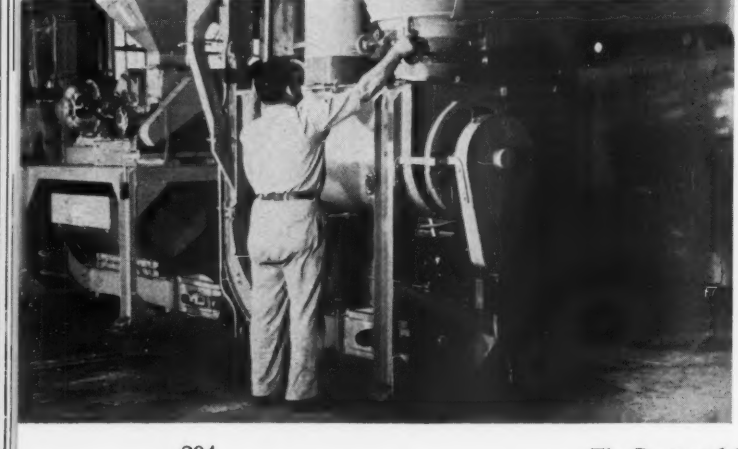
By HARRY J. SANDER
Production Manager, Grove Laboratories, Inc.



Above is shown the weighing booth in the chemical stock room.



Above a workman is hoisting the portable hopper in the granulating room, and below he is dumping the contents of the hopper into the mixer.



MAKING the usual rounds through our plant and stopping now and then to watch with satisfaction the steady flow over our production lines, it is difficult for me to recall the days when operating conditions were quite different from what they are today.

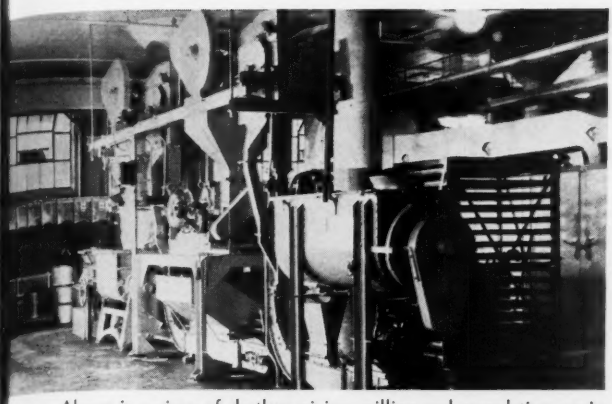
For obvious reasons there is no need to describe antiquated equipment and old fashioned production methods in detail, or to explain the origin of invisible overhead expenses which in most cases were hidden so well that even an expert accountant was unable to find them.

Of course, this does not imply that we were using entirely outdated equipment throughout the plant. On the contrary, our tablet pressing and packaging equipment was quite up to date. In fact, that department was so well equipped that when operating at its full capacity it was impossible for the granulating department to deliver the material as fast as it was consumed by the presses, without working overtime. As a result the savings effected in one department were practically wiped out by the loss of time and additional labor cost in the other. A general survey of our plant revealed that similar conditions existed in other departments as well.

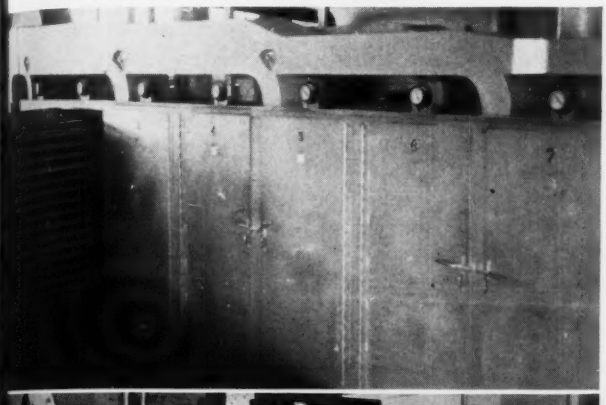
The situation grew worse when in the summer of 1934 we were confronted by the problem of increasing our production capacity in order to meet the rapid growth in our sales volume. Closely related to this problem were others which had been under consideration for some time, such as the re-designing of some of our packages, the improvement of working conditions for our employees, reduction of handling cost, and equally important, elimination of waste and spoilage.

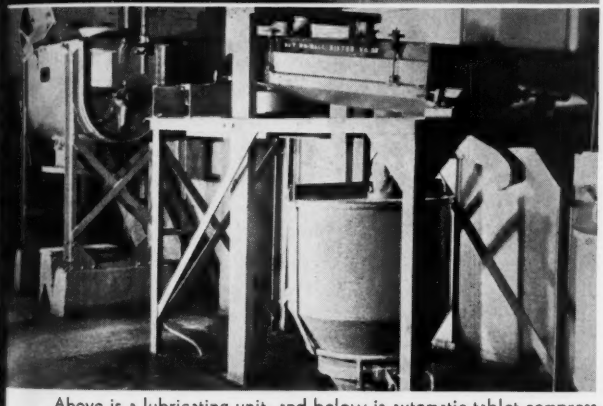
Inasmuch as these problems could not be solved merely by adding new equipment, or by a few localized layout improvements, there seemed to be no alternative but to reorganize practically the entire plant. Having investigated these problems from every angle our management engaged a well-known production engineer with whose advice and assistance we embarked on our modernization plan. At this point it should be remembered that in view of the heavy demands being made on our production department, we could not afford to shut down our production lines for any length of time, but strange as it may seem, during the whole process of plant modernization production continued without interruption.

Once the new plans were drawn and the procedure and equipment decided upon things began to happen



Above is a view of dustless mixing, milling and granulating equipment, and below is a battery of truck dryers.





Above is a lubricating unit, and below is automatic tablet compressing, packaging, and wrapping equipment.

pretty fast. The first item on the program was the drug extraction plant. We had been using the traditional percolators in batteries of six together with a tilting dreg still and it took practically the full time of three men all year around to operate this department.

The main objectives were: 1. To reduce the excess handling of drugs. 2. To speed up the extraction and recovery cycle. 3. To minimize alcohol losses.

A vacuum rotary dryer was employed as an extractor. The vessel is loaded with the ground drug. Then by means of a vacuum pump, it is impregnated with the menstruum by vacuum and mixed with the agitator. After the extraction and recovery cycle has been completed the dry drug is automatically discharged through a quick opening outlet in the bottom of the vessel. For concentrating and drying the extract from the percolate a special heavy duty vacuum pan was installed in addition to one already in use. A condenser and a vacuum pump were connected to each still and a battery of storage tanks was hooked into the line between the two units. This insured greater flexibility and permitted quick transfer of percolate or menstruum from either one of the stills to the storage tanks or vice-versa. As a result of the new lay-out all of our objectives were achieved. Handling cost was brought down to about 35% of the former figure, the extraction and recovery cycle was reduced by one day or more, depending on the type of drug being extracted, and alcohol losses were virtually eliminated.

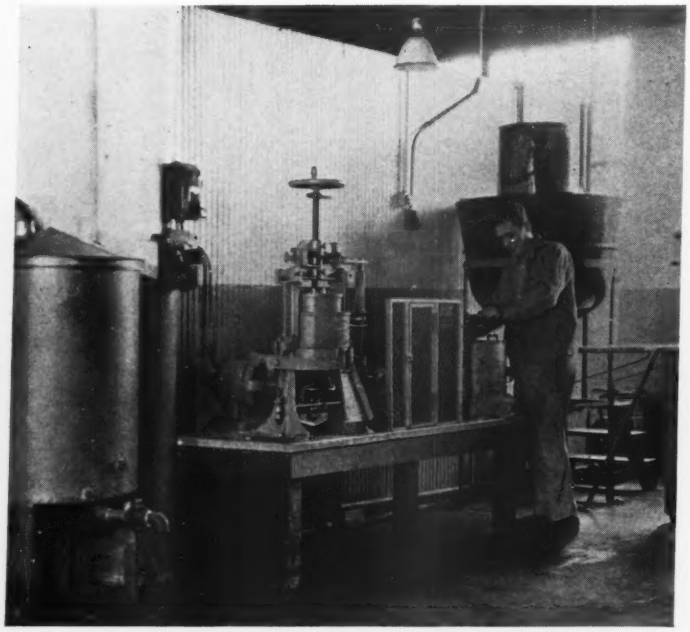
The bottling and packaging department was next on the program. Here we packaged twelve items, all of which were different in size and shape. Some of these items were packaged by means of semi-automatic equipment, others were packaged entirely by hand. Essentially the problem was one of making these packages adaptable to use on automatic equipment and of making provision for future expansion. As a first step all of the products were divided into two groups, one consisting of packages which were to be redesigned for complete automatic packaging and the other group taking in such items which because of small volume and variance of size could be packaged to better advantage by semi-automatic means. A preliminary check up on available equipment revealed that by standardizing certain dimensions, only two lines of automatic equipment would be required for packaging all items belonging to the first group.

Proceeding on that basis two fully automatic high speed lines were installed. Inasmuch as packaging material had to be supplied from the same direction into which finished goods had to travel for final transfer to the warehouse, the U layout was selected.

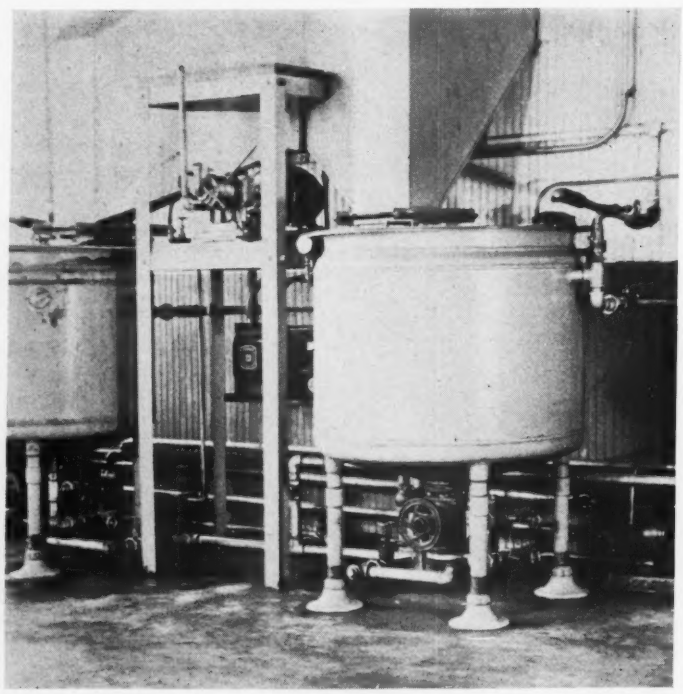
Chill Tonic, Nose Drops and medium sized Porter's Oil, all of which are different in size are packaged on one line. Having standardized two dimensions of these packages the necessary adjustments and change-overs of equipment are very much simplified. Complete sets of change-over parts are located near each machine so adjustments can be handled with minimum interruption of production. Five other products are packaged on the

MODERNIZATION: SIX YEARS AFTER

By HARRY J. SANDER, Production Manager, Grove Laboratories, Inc.



Above is an ointment making unit, and below is a syrup making unit.



second line. The design of these packages had been changed to the extent of making possible the use of a container of identical dimensions for the five items, thus eliminating machine adjustments for product changeovers.

Ample facilities for packaging the items in the second group were provided by the addition of two semi-automatic lines. Completely new lines of processing equipment consisting of steamjacketed mixing tanks, a cooling system and pumping stations as well as transfer and storage tanks were installed. In laying out this equipment provisions were made to insure a continuous flow from the first processing stage to the storage tanks which had been set up on the floor above the filling lines. In order to eliminate the danger of contamination, stainless steel pipes and glass lined tanks were used throughout.

Every effort has been made to provide for better maintenance and working conditions and it would take considerable space and time to mention the numerous improvements made in addition to the ones described above. As a result of this work our operating costs are but a comparatively small fraction of what they were formerly and our plant is immaculately clean.

Having achieved these remarkable results, we next decided to reorganize the tablet making department. In addition to Bromo Quinine we manufacture several other tablets, one of which is a delicately tinted pink cold tablet, whereas Bromo Quinine is of a light tan color. Next to Bromo Quinine which is handled on a large tonnage basis the pink colored cold tablet is the only one which is produced in enormous quantities. Both of these tablets are difficult to manufacture because the compounds of their formula are very susceptible to moisture, a fact which demands rigid moisture control. Moreover, the quinine content make the compounds extremely expensive, and dust loss represented a substantial item of cost.

Our former granulating process involved a great deal of manual labor. The weighed ingredients for each lot had to be scooped by hand into the feed hopper of an old fashioned rotary disc type pulverizer which milled and thoroughly mixed the ingredients in one operation. The horizontal receiving bin of the pulverizer then was pushed to a mass mixer and the powder was scooped into it. Granulating solution was added and after a period of mixing, the moistened mass was then transferred to a granulator. The granulation was collected on trays which were placed on portable drying

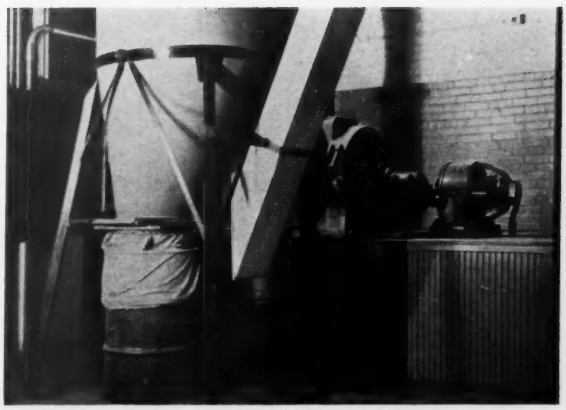
racks and pushed into a large drying room. Following the drying operation the granulation was dumped on a large mixing table. Lubricating materials were added and the entire batch was mixed by hand and sifted. The material then was scooped into barrels for transfer to the compressing room.

All of these operations, aside from being unpleasant, involved a tremendous amount of manual labor and time, and since no provision was made for controlling dust, the department was necessarily very dusty. A careful study of existing equipment and handling methods convinced us that in order to reach our objectives the entire department would have to be reorganized. Above all it was decided that dust had to be eliminated altogether and that the capacity of the department would have to be increased to provide for the phenomenal growth of the business.

The first step was to design a complete new set of truck dryers and portable drying racks. The truck dryers now consist of a battery of eight drying compartments equipped with adequate temperature controls and provided with air capacity of sufficient volume and velocity. The drying racks as well as the trays are made of aluminum and each rack accommodates a complete lot of granulation. As a result of this new set-up the drying time of Bromo Quinine was reduced from twenty-four to an average of six hours per lot, and the time for drying the pink granulation which must be dried down within a fraction of a per-cent of absolute, has been reduced from thirty-six to about ten hours.

Our next step was to change the granulating equipment entirely and to make provision for more efficient weighing operations. Two separate lines of equipment, each of which consists of a powder mixer, pulverizer, mass mixer and granulator were installed. Bromo Quinine is handled on one line and the materials for other tablets are handled on the second line. In making a lot of Bromo Quinine the procedure is as follows: The ingredients are weighed directly into a portable hopper which had been specially designed for this purpose. The hopper then is transferred to the powder mixer by means of an electric hoist mounted on a trolley which in turn runs on an overhead track. The frame of the discharge valve on the bottom of the hopper fits tightly into a flanged opening in the cover of the powder mixer allowing the contents of the hopper to be discharged into the mixer without manual assistance. A Redler conveyor system takes the powdered material from the

(Continued on page 305)



Above is a drug milling unit, and below is the vacuum extraction department.

Below is an automatic bottling line.

MODERNIZING DRYING

By V. P. VICTOR, M. E.
J. O. Ross Engineering Co.

IN ADDITION to baking and oxidizing drying systems, which range in temperature up to 1000° F. for hundreds of well known products, there is another field of moderate and low temperature drying, the primary function of which is the removal of water from the product. In the case of many chemicals, drugs, and the majority of foodstuffs, it is well known that better results can be obtained by utilizing lower drying temperatures with corresponding compensations in the humidity. Excessive surface drying, causing case hardening, warping and cracking, as well as shrinkage, discoloration or excessive loss of moisture, is prevented by proper control of humidity.

Some of these moderate temperature dryers require dehumidification of the supply air.

There are two general methods in use for dehumidification of the air:

1. By condensing the excess humidity out of the air.
2. By adsorbing the moisture from the air.

Dehumidification by condensation requires cooling the air to the temperature at which the air, due to its physical properties, can hold only the required amount of moisture. Thus the final moisture content of the air depends on how far down the air was cooled. A cooling medium is required, which is usually derived from one or more of the following sources:

(a) Circulation of well water.
(b) Melting of ice supplied from an outside source.
(c) Refrigerating compression system — the well known refrigeration machine — mechanically driven.
(d) Vacuum water vapor system, more generally known as steam jet or centrifugal refrigeration.

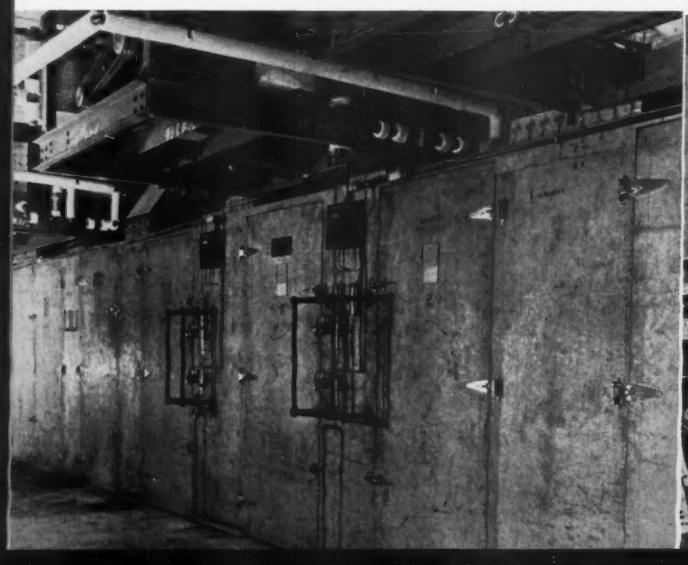
These are the systems that have been generally known and used wherever moderate temperature drying is required. The selection of the method of cooling, the proportions of apparatus, the degree of cooling desired must be decided in each case, depending upon the problem presented for solution. Any or all of these methods of cooling could be used, but, regardless of that, the general system is the same.

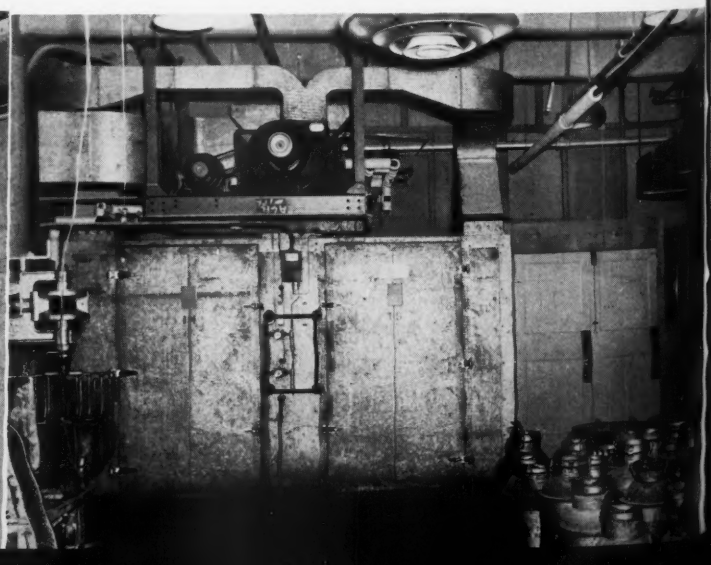
The adsorption system of dehumidification operates on a different principle, and much research and development has taken place and is going on to utilize the numerous advantages presented by this cycle in many industries. While I speak of this as applied to dryers, it should also be understood that this same method of dehumidification may be used to advantage in many cases on industrial air conditioning systems.

The adsorption system utilized a stable, dry, granular material for removing the moisture from the air. This process does not entail any cooling of the air. The latent heat of the water vapor in the air is converted into sensible heat, which increases the air temperature. Therefore, there is an apparent effect of heating the air rather than cooling it down. The moisture from the air is retained in the adsorption beds and is subsequently driven off by regeneration means. Meanwhile, the alternate beds are used so that the cycle is continuous.

In ordinary dehumidification by cooling, there are inherent disadvantages, one of these being that the cooling removes sensible heat from the air, which often presents an unnecessary amount of work to be done, only to require additional subsequent reheating of the air after it has been cooled and dehumidified.

The adsorption method is much more efficient, due to the conversion of the useless latent heat of the vapor into the useful workable potential of sensible heat. In the case of many dryers, the adsorbing method often provides air sufficiently heated for the purpose. Also, at temperatures be-





Below at the left is shown a battery of granulation dryers, and at the right is a battery of effervescent salt dryers.

EQUIPMENT

low freezing in the refrigeration system, the removed moisture accumulates as solid ice on the coils and necessitates the periodic melting of the ice on the coils. On the other hand, extremely dry air may be secured by the adsorption system without the necessity of cooling the air down to any corresponding temperature, which results in a very large saving in power.

However, the adsorption method is not without characteristics, which often presents obstacles to its use and the local conditions determine the advisability of its application.

With the adsorption system, any cooling of the air is distinctly a separate function from the removal of moisture, and therefore has to be performed separately. Whenever the problem involves both cooling and dehumidifying, the refrigeration method may prove to be the most efficient and desirable.

Many drying systems have been installed, utilizing dehumidified air, which has been obtained by either of the above methods, namely—refrigeration or adsorption.

However, certain products could be dried to a required final moisture content at relatively high humidities and moderate temperatures. Certain drugs, the majority of granulations, and the bulk of chemicals fall into this group.

The absolute humidity in the dryer handling such materials is maintained above the possible maximum humidity of outside air in Summer time. In other words, the outside air throughout the year contains less moisture than the air in the dryer proper. Therefore, whenever moisture is absorbed from the material by the air circulated through the dryer and in order to maintain moisture content of the air in the dryer constant, some of the air will be exhausted, an equivalent amount of outside air will be taken in, and the balance of the air will be recirculated.

The relative amounts of exhaust, makeup, and recirculated air are automatically controlled by simultaneously positioning the multiple dampers in respective ducts. In Winter time, when outside air is very dry, only a small portion of the circulated air will be exhausted, whereas in Summer time it is quite possible that the entire volume of air will be taken from outside, properly heated, passed through the dryer, and ejected to outside.

The amount of exhaust air is directly proportional to consumption of heat (steam, gas, hot water, oil, etc.). Exhaust could be cut down to a minimum provided the following major duties and construction of the dryer will receive due consideration:

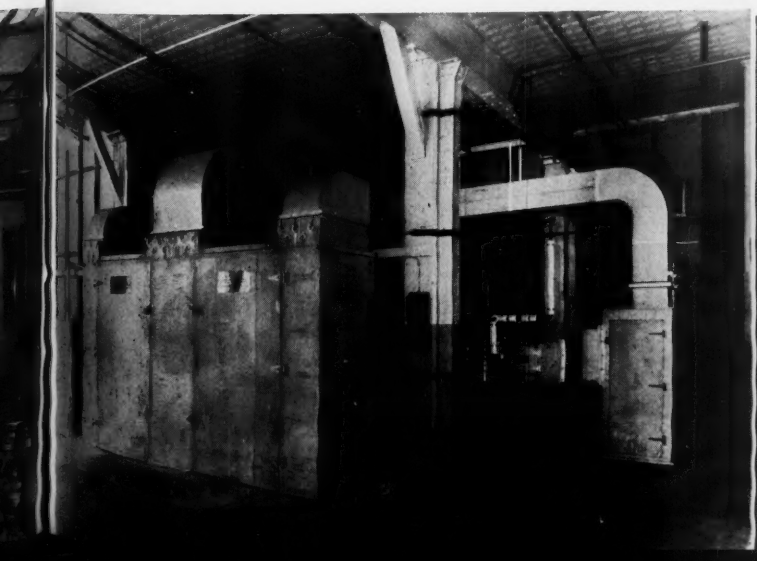
(1) The rate at which the goods will give up moisture is not impaired by higher vapor pressures, and the drying time is not excessively prolonged.

(2) The final moisture content of the product and corresponding equilibrium vapor pressure is equal or greater than the vapor pressure maintained in the dryer.

(3) The construction of the dryer is such as to permit the maintenance of high moisture concentration. In actual practice, dryers operating at atmospheric pressure seldom maintain air at dew point temperature higher than 180° F., corresponding to vapor pressure of 15 to 16 inches mercury.

Very often, the desire to reduce the heat consumption by cutting down the amount of exhaust air defeats the very purpose of the dryer, namely, the removal of moisture from the goods. At the same time it is highly questionable whether or not the TOTAL heat consumption per operation or batch for greater duration of time and a longer drying cycle is less than product of greater unit heat consumption and a shorter drying time. The following example is self explanatory:

Former drying time—24 days or 576 hours.
Former steam consumption—5 pounds per hour.
Present drying time—4 days or 96 hours.
The difference in the TOTAL steam consumption per operation is (576 hours x 5 pounds) – (96 hours x 25 pounds) = 2,880 – 2,400 = 480 pounds of steam, or Reduction in steam



Below at the left is shown a battery of Hi-Speed pill dryers, and at the right is a chemical dryer showing a typical chemical truck.

consumption = $\frac{480}{2880}$ = 17% in spite of the fact that the unit consumption has been increased from 5 to 25 pounds, or five times the former amount.

Approaching this matter from a thermodynamic point of view, one can easily prove that at a same maintained dry bulb temperature in the dryer, and at a constant rate of circulation, air will have practically the same ability to remove or to absorb moisture, regardless of its unitial moisture content, or vapor pressure.

This fact is probably responsible for a great deal of confusion, inasmuch as the theoretical ability of air to pick up moisture is often limited in practice by the previously outlined factors, and the overall economy due to the reduced exhaust is questionable.

In case of continuous or conveyor type drying systems, progressive increase in the absolute humidity of air counter-current to the direction of goods travel is the best method to attain the highest efficiency from heat consumption point of view.

Two or more air circulating zones with independent sets of controls are used. The initial cost of apparatus for extra zones must be carefully compared with resulting operating economy. For example:

For the same duty, total air circulation and drying time, four zones were considered:

No. of Zones	*Steam Consumption Pounds per Hour*	*Air Exhaust in Summer*	*Percent Reduction Steam Consumption*
1	6,600	100%	
2	4,600	50%	30%
3	3,600	32%	45%
4	3,400	23%	49%

Obviously, the installation of a dryer incorporating two zones resulted in the maximum economy. Slight compromise in the fuel saving was more than offset by the difference in the initial cost of two against three zones, and by the corresponding reduction in the depreciation rate chargeable against operation of the two zone dryer.

Performance of a dryer should not be judged by the efficiency of the involved thermodynamic cycle, usually expressed in terms of brake horsepower and pounds of steam consumed to remove one pound of water from the product, but by the final results which are the combination of time, initial and final moisture contents, nature of the product and method of material handling, allowable temperatures, and rate of air circulation.

Obviously, a lot more of prime mover energy will be used up in removing one pound of water from the product in the final stages of drying operation, when producing a final moisture content of less than one tenth of one per cent. than, say, seven or ten per cent.

Usually, the initial cost, as well as the operating charges, against the new dryer are considerably higher than on the old dryer.

However, the comparison should be made on the basis of results rather than two pieces of equipment. In the previous example, the drying time was cut down to $\frac{1}{6}$ of the former time. Therefore, making allowances for variations in scheduling, the new dryer could be rightfully compared with at least four old dryers. Besides, the reduction in the production time and saving of floor space, there are many other advantages of intangible nature which are nevertheless present.

Reduction of spoilage and labor cost, due to utilization of automatic controls, cleanliness, greater operating range of temperatures and humidities, improved quality, certainly that the operation will be completed on time, etc., are not readily measured in dollar values.

It is also true that modern air conditioning systems and controlled humidity dryers are more complicated than their predecessors. But, it is equally true that the improved efficiency everywhere—in power plants, transportation and communication means—had always been achieved at the sacrifice of simplicity. There could hardly be any comparison between a modern automobile and a horse and buggy of the days gone by.

At the present time, the demands imposed upon manufacturing facilities in many a plant make it imperative that every square foot of floor area be used to a maximum advantage, and that as much equipment as possible be efficiently operated on a definite schedule basis with a minimum of time wasted.

Modern dryer is a full fledged production unit in spite of the difficulty of computing its duty in terms of dollars, estimating the rate of profit return and the length of time it will pay for itself.

Modernizing Factory Surroundings

(Continued from page 292)

suckle, and many more. These can be employed in such a manner as to be attractive and practical and at the same time provide unusual interest through their suggestive qualities.

In the pharmaceutical field there is even greater opportunity to use suggestive drug plants such as digitalis, witch hazel, black haw, or viburnum. In the flavoring field we find sassafras, calandula, wintergreen, peppermint, and others. Following is a partial list. Many more would undoubtedly come to mind in dealing with individual factories.

Aconite
Actaea
Adiantum
Aloes
Althaen
Angelica
Arserum
Asclepias
Blasam
Baptista
Bayberry
Blood Root (Sanguinaris)
Calamus
Calandula
Camomile (Anthemis)
Cascara (Rhamnus)
Caelophyllum
Digitalis
Ginseng (Panax)
Goldenseal (Hydrastis)
Ladyslipper (Cypripedium)
Larkspur
Lavender
Lobelia
Melissa
Orris (Iris)
Oak (Quercus)
Partridge Berry
Pennyroyal (Hedeoma)
Peppermint (Mentha Piperita)
Podophyllum
Safflower (Carthamus)
Senega Snakeroot
Spearmint
Trillium
Veronica
Veratrum
Wintergreen
Witch Hazel (Hamamelis)
Wormwood (Artemisia)

It is obvious that the interest of the worker is increased if he can see growing around the factory the same plants which he handles in making medicine, flavors, or perfumes within. Of course we must use plants which are adaptable to conditions of soot and gas as well as existing soil conditions. This does not limit our choice as much as we might expect. Many delicate looking plants will endure rigorous conditions. For instance, holly and magnolias are two which are considered luxury plants and are, as a matter of fact, quite hardy except under the worst possible conditions.

Plant material should be chosen for its value to the picture as a whole rather than for its own sake. In other words, plants should be dark green, unobstrusive, depending for their value on texture and shape, rather than upon exotic colors. In that area which is to be the front or show-window of the factory it is well to have a dominance of good green grass. This is valuable not only because it provides a perfect setting for the building, but also because it lays dust, prevents washouts, and conserves moisture for other vegetation.

Let us then review a typical procedure in which a trained landscape architect should be the guiding spirit because only he can solve a planting problem economically and satisfactorily:

1. Draw plans in conjunction with the architect for the placement of the building or buildings, the layout of roads, walks, parking fields, taking into consideration ease of operation, convenience, drainage, etc.
2. Draw planting plans keeping in mind the possibility of expansion and style and purpose of the building.
3. Choose so that effect will improve in time rather than deteriorate.
4. Choose plants having some connection with the industry involved, if possible.
5. Consider winter as well as seasonal effects.
6. Use plants adaptable to local conditions.

Now we shall analyze the landscaping problem of the Northam Warren Corporation in Stamford, Connecticut, shown in the illustration. Across the entire front facade of the building only seven pieces of plant material were used exclusive of the yew hedge. Ten years, twenty years from now the scene will be improved rather than deteriorated with no additional expense to the owners. Pin oaks were selected for the largest trees, typifying as they do strength and permanence, as well as withstanding conditions of smoke and soot which may come from adjacent factories.

The hedge and the two trees either side of the towers in composition add to the spectacular effect of the building itself by their striking difference in shape and texture. Unfortunately in the photograph the magnolia had not attained full leaf. The low yew was selected as to variety because of its slow growth and dark green color.

The placement of the remaining oaks is such that the fact that the building does not parallel Barry Place is concealed. The entire effect is restful, strong, and yet softened by the rather exotic shape of the magnolia whose delicate and exquisite flower typifies the cosmetic products of the company. The planting to the south is informal and casual and mellow to harmonize with the natural attractiveness of the golf course adjoining one side of the building and to cover the scars caused by the necessary regrading. In the rear nothing was done except the planting of a smooth lawn because of the possibility of expansion which would naturally go in that direction.

This of course is a new, compact factory presenting a relatively easy problem. This building was placed as short a distance back from Barry Place as would give it an attractive setting so as to leave as much property as possible inviolate in the rear for future expansion. It was placed as near the north line as would be consistent with proper manipulation of the railroad siding and truck loading platforms. The parking area is in close proximity to the rear entrance which employees use. I feel that this factory landscape problem was solved economically and attractively, without fuss or furbelows. The answer is direct and to the point, in keeping with the utilitarian purpose of the building.

The problem of landscaping a new factory is always comparatively easy. For each new factory, however, there are hundreds of older ones, monstrous monuments of past mistakes which involve too great an investment to discard. These were often built of poor materials, were architecturally poor and present to the eye a conglomeration of tanks, bins, and delapidated shacks. Around many of these plants the grounds are a dump heap, hard packed by travel, and dedidedly unsightly.

What can we do with these old factories? The least we can do is to clean up and improve the ground to the extent that it will support a stand of grass. We can segregate parking in some unobtrusive spot and possibly screen it from view. By suitable planting we can hide some of the worst blights on the scene such as stacks, tanks, dumps, sheds, bins, etc.

Studies have shown that the worker's attitude has as much to do with his output as his aptitude, and his attitude is favorably influenced by attractive surroundings. Corrective landscaping can be done for a cost so small that it is almost negligible compared with the returns from it. It raises the value of the property many times this cost in added use and enjoyment as well as actual value in improving personnel relationships.

Results of Modernization

(*Continued from page 281*)

come into being. The Norwich organization has become so imbued with the thought that it is always possible to find a better way or a better product, that any expectation of a period of relaxation has vanished and we now know that when you once start a modernization plan and an organization grasps its meaning and significance, that there will never again be a time of mental peace and quiet with such a group.

MATERIALS OF

By PAUL F. DWYER

MODERNIZATION deals with old, rather than new factories. When a building is of the wrong type or has been poorly designed for one reason or another, very little can be done about it excepting insofar as it is possible to landscape the area around the building and thus mitigate its ugliness. It is possible, however, to modernize the inside of an old building so that, once you pass its portals, the interior is as modern in appearance as it would be if the building were recently erected. For example, the interior of a mill type structure with wooden floor beams, wooden columns (which usually are cracked), and exposed brick or rough tile walls can be converted into a streamlined modern interior.

An excellent example of this was the work done at a well-known pharmaceutical firm in connection with the modernization of its offices and research laboratories. These departments were placed in three old buildings built together in the shape of a U, the youngest of which was over thirty-five years old. The buildings were all of mill type construction with wooden floor beams and joists, from which hung suspended a confused mass of piping and lighting fixtures of every imaginable variety. The walls were of common brickwork and the building columns were of wood. By installing a hung ceiling of acoustical tile and furnishing lighting and ventilating fixtures and sprinkler heads that were flush with it, the heterogeneous mass of piping and wiring conduits was concealed, and the ceiling now presents a smooth unbroken line which makes it look much higher than the old ceiling in spite of the fact that it actually is considerably lower.

Similar treatment was given the side walls through the installation of pale green Marlite which is a pressed fiber board having a lustrous color finish on one side. This material not only furnishes wall finishes in all imaginable colors, but it also furnishes a high degree of insulation. Since its smooth factory-finished surface is impervious to wear, these walls will require no maintenance as long as the buildings last. The colored Marlite panels conceal all brickwork entirely so that from the interior of the building it is impossible to tell of what materials the buildings were constructed. In the office area the wooden floor is concealed with rubber tile. The wooden columns also were concealed with Marlite panels. By

Above is shown the bacteriological laboratory before modernization.

Below is shown a factory office before modernization.

F MODERNIZATION

Above is shown the bacteriological laboratory after modernization, note the cleanliness of the wall and floor treatment.

Below is shown the factory office after modernization, note the effect of wall and ceiling treatment.

concealing the original ceilings, walls, and floors of these old buildings, they have been made to look as clean and modern and streamlined as they would have been had the buildings just been erected. The following summary lists some of the materials which may be used for modernizing the interiors of old buildings. The materials selected for a given purpose will depend upon the nature of the area being modernized, and also on the amount of money available for the project. Inexpensive materials mixed with imagination will work wonders.

CEILINGS:

Acoustical Tile, Acoustical Celotex, Insulboard, Weatherwood, Plaster Board, Fiber Board. Most of these materials are available in large panels which can be attached to furring strips or directly to ceiling beams and will furnish a hung ceiling having in all cases more or less value as insulation and as soundproofing, depending upon the specific material employed. A number of these materials are available in various small sections so that they can be laid like tile and some also are furnished in a variety of colors. Others can be finished with paint or some of the rough finish plaster paints such as Morene, Craftex, etc.

LIGHTING:

Fluorescent Lighting, Shadowless Lighting, Panel Lighting. For lighting offices, factories, and laboratories fluorescent lighting seems in the last few years to have taken precedence over all other forms. A great variety of fixtures are available from numerous sources and these are so designed that they can be fitted flush with a hung ceiling. These fixtures are available in a variety of suspended types. A number of lighting fixture manufacturers furnish fluorescent lighting fixtures faced with what is known as waffle glass which conceals the tubes and provides a soft diffused light. Other manufacturers are promoting what is known as shadowless lighting fixtures which are special forms of fixture intended to diffuse the light from ordinary bulbs so as to provide uniform lighting of the desired intensity. Panel lighting is a form of flush lighting fixture intended to be built into side walls or ceilings. Fluorescent or ordinary lighting tubes can be employed in them.

(*Continued on page 315*)

FUNCTION OF TIME AND MOTION STUDIES IN PLANT MODERNIZATION

By NORMAN CLARK, Personnel Director, Norwich Pharmacal Company

A CRITICAL examination of the methods of time and motion study shows how important they are in every plan or program for plant modernization. The facilities offered by an organized and well functioning time and motion study department are invaluable to modernization. However, in plants without an organized time and motion study department these facilities must be supplied by someone familiar with the methods of such a department. Management must know beforehand that modernization costs are justified from every angle.

The chief tool of time study is, of course, the standard or the measure of the work. In plants where standards are accurately set they represent the labor cost for a given operation and are valid as long as no changes in method or equipment have taken place. However valid these standards may be for a particular plant, they will be high and act as a handicap if that plant places limitations upon operations by retention of less modern layout and equipment. Comparison of standards for line set-ups, individual machine operators, material handling, shipping department work, stock departments, service departments and departmental office work with available standards for similar work,—gives a point of departure and an indication of the savings possible under modern conditions.

Good time study practice demands that all standards be rechecked periodically. Here is an excellent opportunity to let time and motion study work for continual modernizing and improving of plant operations. At the time each standard is rechecked these questions should be asked:

Where could this work be done more conveniently and effectively?

Why is the work done this way and could a machine or mechanical aid be devised to handle the work?

Through a periodical re-examination of each standard in this critical manner suggestions and continual stimulation will result. Recently this observer found by rechecking and reviewing a series of hand work standards, that a straight line production set-up would better organize the work and prevent savings. This meant providing a table equipped with a moving belt and several special work stations.

The time and motion study department has great value in modernization plans since the accumulating of basic facts goes on continually. Every good time study records very useful data, that at the time the study was taken may not have been regarded as extremely important for purposes other than setting the standard. However, this information is there for use. For example, the basic distances recorded on trucking standards are extremely useful in readily preparing new layouts. Production records available in the time study department are the source of basic facts for the justification of new methods and equipment. In many cases these records are made to order since they are so recorded in relation to the stanards for the work that they can be broken down to serve in modernization planning.

The departmental analysis sheets offer points of departure for modernization work. These records show the month to month changes in labor costs. Examination of the indirect charges will show whether operations are penalized by heavy indirect charges such as repairs and maintenance of old and worn machines. In

cases where the repair and maintenance functions are not handled by the production department, a thorough investigation of the records of the mechanical group doing this work should take place.

Notations are usually made in standards covering the working conditions at the time the studies are made. Where these factors are extremely fatiguing, allowances have been built into the standards. Improvement in modernization of the conditions under which the operations are done will reflect themselves in lower standards and more contented personnel.

Time and motion studies show clearly the pinch points or bottle necks in various operations. Needless to say, these conditions are costly but in the majority of cases they can be corrected with modern equipment or modern layout. Machines of greater capacity can be found to step up flow through the pinch point. Gadgets of simple design often can be devised to assist at these points. Problems of "gadgetry" capture the interest of all to whom they are presented. Capitalization of this interest is possible if attention can be directed to them through sound time and motion study technique.

Once modernization has been accomplished, the problem of keeping operations thoroughly modern is essential and a well designed and operated time study department will aid in this effort. Daily utilization of the tools this department offers will keep any plant modern and under continual modernization effort.

Modernization: Six Years After

(*Continued from page 297*)

mixer to the pulverizer and from there to a floating scale hopper. After the weight of the lot has been rechecked the material is discharged into the mass mixer. Granulation solution is added and after appropriate mixing the moistened material is transferred to an oscillating granulator and from there to drying racks as described above.

The procedure followed on the second line for handling material for the other tablets is very similar except that portable hoppers operated by the monorail system are used for effecting transfer from one operation to another. This system was selected to facilitate quick cleaning and change-over from one product to another.

A dust collection system is used throughout the department. Weighing counters are fitted with high velocity hoods connected to a main duct and wherever required the equipment is connected directly to the system. The new lubricating equipment and handling methods save at least fifty per cent. of the time formerly required for the lubrication process. Our new granulating system is entirely dustless and the saving in quinine, formerly lost in dust and spillage, has paid for the new equipment.

In our compressing department some new presses and packaging equipment were installed to bring this most modern section of our plant up to the highest peak of efficiency. In this department tablets are packaged directly from the presses, the operation being almost entirely automatic.

Toward the end of our modernization program new equipment was installed in the ointment department and a cold storage room was constructed. Fully equipped maintenance shops for machinists, electricians and carpenters were set up, insuring quick service at a moment's notice. Many more improvements were made throughout the plant and much equipment had to be specially designed for individual operations.

Was the cost of modernization a good investment? Well, here is the answer. The entire cost of the job was repaid within three years; our plant capacity has been tripled; our factory is at all times as clean as a hospital; and our savings permitted us to pension certain of our older factory people at full salary.

Modernization at Merck & Co.

(*Continued from page 290*)

who checked the correctness of stock selected to fill the order, and then to the packers. Packed cases were taken to delivery platform on hand trucks.

Difficulties with this setup included the following problems:

Because the shelf trucks had no guide rails or tracks they frequently rolled out of line. Their chronological order sometimes became mixed and parts of orders which covered two or more trucks were difficult to keep together and consolidate. Checkers' and packers' benches were plain work tables to which the operators made alterations conforming to their own ideas concerning bins, pigeon holes, etc.

The foreman of the order fillers developed a "scooter" on which the operator rides while collecting items called for on orders. This scooter has baskets similar to the self-service market type. The scooter loads are delivered to the aisle ends and loaded on a monorail system which has replaced the steel shelf trucks which rolled on the floor. The monorail carriers ride on two parallel lines, one for rush orders, and a second for routine orders, with provisions for switching from one line to the other.

The checkers' benches are now constructed of steel, and arranged in a circular workplace, according to principles of motion economy with standardized pigeon holes for sorting orders according to traffic routings. The monorail lines pass these benches on their way to the packers.

The packers' benches are the result of applied motion economy with a bin or receptacle for each type of packing material, stencils, adhesives, brushes, and labels.

To deliver packed boxes and cases to the delivery platform a live roller conveyor runs between two rows of packers' benches.

(*Continued on page 315*)

YOUR NORTHERN MARKET VOTES FOR

SCOVILL-MADE CONTAINERS

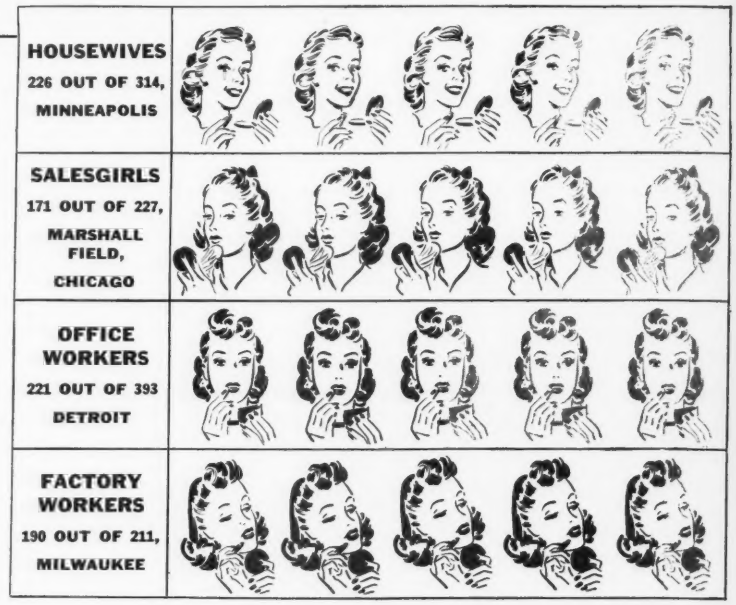
72% of housewives . . . 75% of salesgirls . . . 56% of women office workers . . . 90% of women factory workers in the great North Central area . . . use cosmetic products of manufacturers who have come to Scovill for one or more containers in their line. Once again, the biggest sales are made by Scovill customers.

ATTRACT MORE WOMEN

Not surprising — that Scovill designs in metal attract more Northern women — housewives, salesgirls, secretaries and factory workers alike — or that other surveys* confirm country-wide preference for Scovill-made containers.

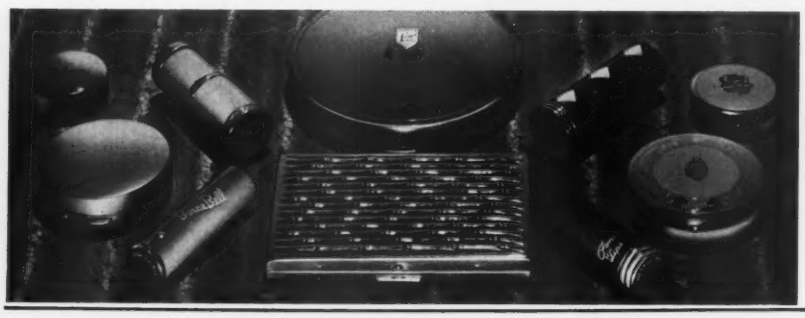
New metal or new metal-plastic combinations, new and ever more attractive durable finishes — of which brilliant, marresistant "Indurite"† for aluminum is a good example — make up Scovill's ever-growing contribution to *more sales for cosmetic manufacturers.*

*See previous Scovill advertisements in DRUG & COSMETIC INDUSTRY. Full details available on request.
†Reg. U.S. Pat. Off. by Scovill.



SCOVILL'S PRODUCTION PLUS Unique advantages of working with Scovill to solve your container and closure problems: idea-development . . . *plus* faithful, economical engineering from blue-print or model . . . *plus* high-production facilities ready to swing into action without delay. Call in one of our representatives from the nearest office listed below to get full facts on how Scovill has helped many famous cosmetic firms to market leadership. Scovill Manufacturing Company, Drug and Cosmetic Container Division, 69 Mill Street, Waterbury, Conn.

NORTH, SOUTH, EAST AND WEST . . .
SCOVILL CONTAINERS ARE SELLING BEST

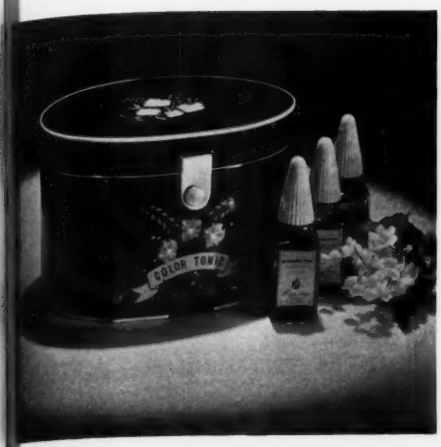


Scovill
Masters of Metal
MANUFACTURING COMPANY
WATERBURY, CONN.

Boston, Providence, New York, Philadelphia, Syracuse, Pittsburgh, Chicago, Cincinnati, San Francisco, Los Angeles
IN CANADA: 334 King Street, East, Toronto, Ontario

PEGGY SAGE

Peggy Sage's Color Tonic package is done with the atmosphere of gardens and of spring. It is fragrant with sachet, and inside is a flower boutonniere, ready to be placed on a lapel. It contains two polish shades (choice of three new "tonic" colors, Rhubarb, Fireweed and Ginger Tea), satinbase, polish remover, emery boards, file, orangewood stick, and nail white pencil.



PEGGY SAGE

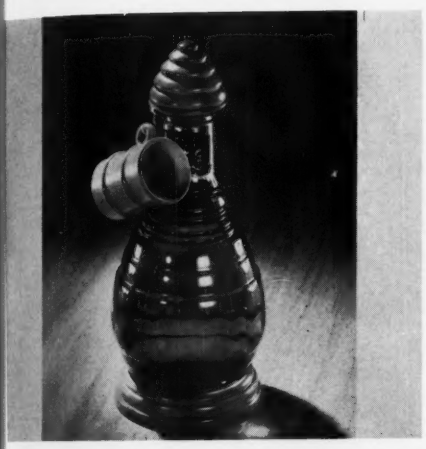
HOUBIGANT

Houbigant introduces a complete, new simplified make-up line bearing the name of "Translucid," which is translated "glowing through." The make-up essentials of a new foundation lotion, face powder, rouge, lipstick and powder vanity are packaged in modern containers bearing a newly styled, but thoroughly familiar, "basket of flowers" insignia.

HOUBIGANT

JOHN BRADSHAW

John Bradshaw has again created a new-old-colonial character—Surfoam Liquid Bubbling Bath in a quaint old New England rum decanter, fitted with a beehive motif maple wooden cap and base. Hanging on a miniature hook in the old-time bee-hive cap is a jigger in the guise of a New England wooden mug.



JOHN BRADSHAW

RICHARD HUDNUT

Richard Hudnut presents Spring Lilac fragrance in yellow, lilac and green packages. The new Spring Lilac family includes toilet water—with and without atomizer—cologne, dusting powder, talcum, and three sizes of perfume.

RICHARD HUDNUT

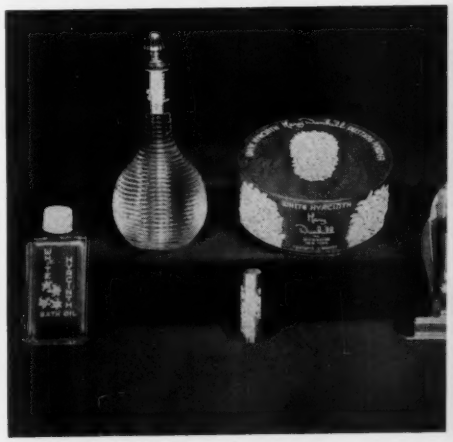
DOROTHY GRAY

Realizing that many girls and women would gladly harmonize rouge, powder and lipstick were it economically possible for them to do so, Dorothy Gray has produced the Portrait make-up box as an economical answer. In a charming pink package, traced with dainty, white flowers and blue bows, there are three make-up essentials—a full-size lipstick, compact rouge in the same shade, and a box of Portrait face powder, blended for this particular make-up color. The package sells for the price of the lipstick alone.

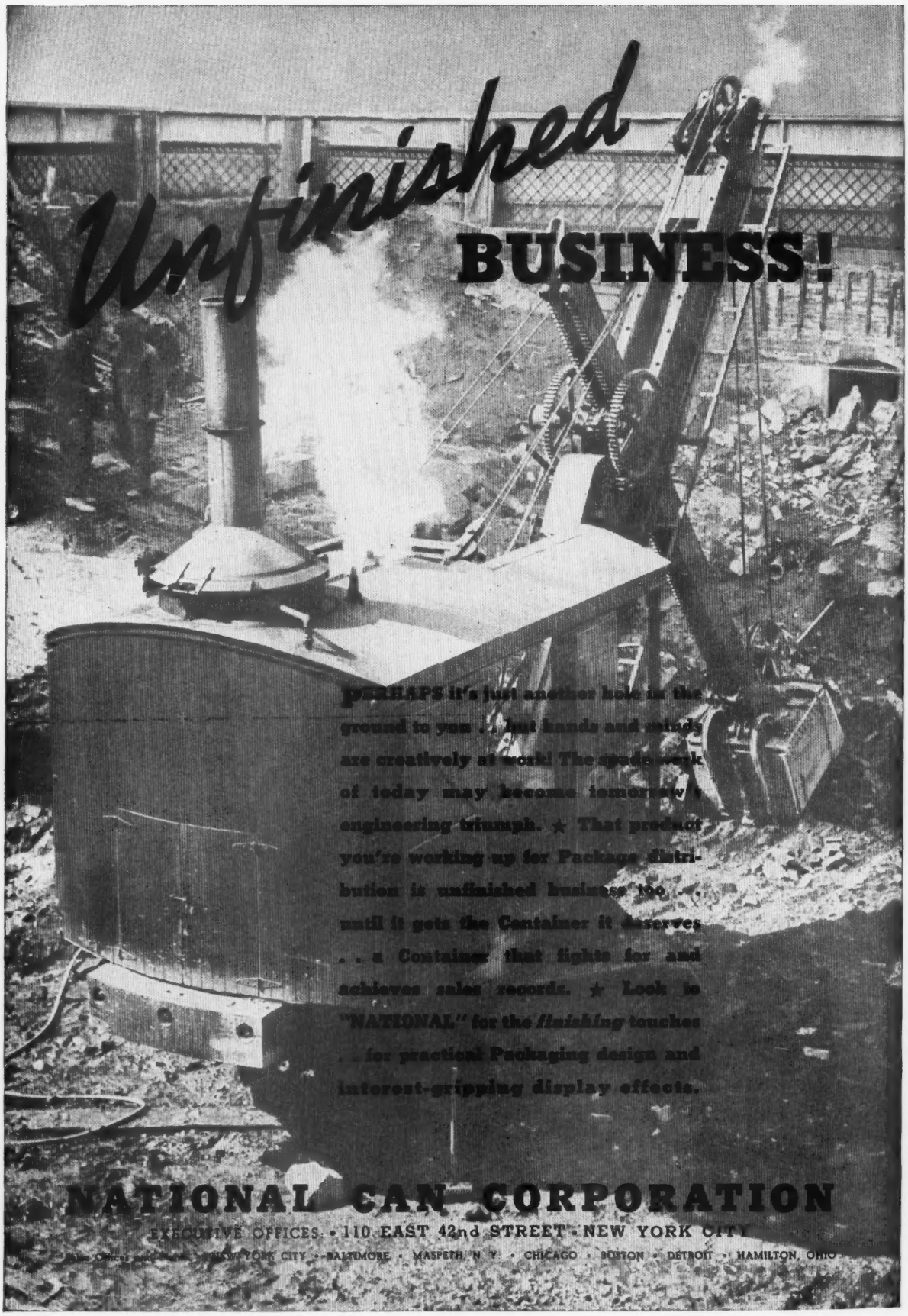
DOROTHY GRAY

MARY DUNHILL

Last year Mary Dunhill introduced White Hyacinth perfume. It proved so popular that this Spring Mary Dunhill is bringing out an entire new White Hyacinth Fragrance ensemble, consisting of perfume, cologne, lipstick, dusting powder, bath oil and sachets.



MARY DUNHILL


Unfinished
BUSINESS!
PERHAPS it's just another hole in the ground to you . . . but hands and minds are creatively at work! The spade-work of today may become tomorrow's engineering triumph. ★ That product you're working up for Package distribution is unfinished business too . . . until it gets the Container it deserves . . . a Container that fights for and achieves sales records. ★ Look to "NATIONAL" for the *finishing* touches . . . for practical Packaging design and interest-gripping display effects.
NATIONAL CAN CORPORATION
EXECUTIVE OFFICES • 110 EAST 42nd STREET • NEW YORK CITY
NEW YORK CITY • BALTIMORE • MASPETH, N. Y. • CHICAGO • BOSTON • DETROIT • HAMILTON, OHIO

ADMINISTRATIVE PROBLEMS

THE FTC COMPLAINTS ISSUED AGAINST COTY AND BOURJOIS some four years ago charging violation of the Robinson-Patman Act, have been dismissed. But new complaints were issued against these firms upon dismissal of the old complaints December 27, 1940. However the new complaints cover only the subject of demonstrators and entirely ignore the other points complained about in the old citations, such as P. M.'s, and advertising allowances. Evidently the Commission found that there was no violation in these other practices since the complaints citing them have been dismissed. We hope that the Commission will act quickly on the complaints issued against the demonstrator practice so that the industry as a whole will know where it stands. Four long years without a decision is not very helpful to manufacturers who want to obey the law but who, at the same time, do not want their competitors to have an unfair advantage.

THE STATE LAW SITUATION IS JUST AS INVOLVED as it has been all this year with the large majority of state legislatures in session. The answer to just what this industry will get in the way of state legislation this year will not be answered until these state legislatures are all adjourned some time next month. In the meantime manufacturers in this industry must cooperate promptly and willingly with the officials of their trade associations who seek the help of local manufacturers in meeting situations in various states.

INGREDIENTS OF DRUG PRODUCTS WHICH ARE STRICTLY PROHIBITED by the Food and Drug Administration were mentioned in our January issue. It was stated that these products could not be distributed for use even by physicians. The products mentioned are: Dinitropheol, dinitrocresol, diethylene glycol, ethylene glycol, Carbitol, Cellosolve, all other glycols and glycol derivatives except glycerine and propylene glycol, lead nipple shields and devices, nasal devices. Some people have inquired whether this prohibition against these products referred to cosmetics and drugs alike. The answer is no. The products are banned for use as drugs since the statement said that they could not be distributed for *use even by physicians.* Some of the products mentioned in the list are widely used in cosmetics and are known to be quite harmless when used externally. Others have never been used in this manner and probably never will be thus employed. Certainly if dinitrophenol or dinitrocresol were used externally it would as a reducing agent absorbed through the skin. And since a reducing agent is a drug, the products could not be used in this manner.

THE RECENT DECISION OF THE U. S. SUPREME COURT declaring that Federal laws do not apply in cases of intrastate commerce even though practices in intrastate commerce might affect interstate commerce is of vital interest to this industry. It is a peculiar thing that most of us had come to the conclusion that the Federal Administration was going to get away with the practice of controlling intrastate commerce through Federal laws on the claim that abuses of Federal laws wholly within a state might interfere with interstate commerce. Now the court, a large number of the justices of which were appointed by the present administration, rejects this theory and goes back to what was always considered the law before the present administration came into power.

The Roosevelt appointees on the bench were divided and this is why the decision was handed down as it was. In fact, one of the Roosevelt appointees, Justice Frankfurter, wrote the decision. Concurring with him was Justice Murphy, another Roosevelt appointee, and Chief Justice Hughes, Justice Stone, and Justice Roberts. Opposing the majority opinion were three Roosevelt appointees, Justices Douglas, Reed, and Black. There is one vacancy on the court.

The case in point was that of Bunte Brothers, candy manufacturers, who sold in Illinois what is known as "break and take" packages in which the amount which the purchaser receives for his money depends on chance. The FTC sought to control him because of what they claimed unfair competition with out-of-state manufacturers. The court ruled that the FTC could not control intrastate commerce.

HOW YOU CAN BE SURE OF QUALITY AND UNIFORMITY

Quality and uniformity . . . those are the two essentials in any pharmaceutical.

To be sure of both, look to Monsanto as your source of supply.

Every step in the manufacture of Monsanto Pharmaceuticals is rigidly controlled. Every batch is carefully analyzed by expert chemists. As a result, Monsanto Pharmaceuticals have been widely used and highly regarded for many years.

Write today for this new booklet which describes Monsanto's complete line of products ...and refer your special problems to our Technical Service Department. You will find the Monsanto technical staff both helpful and willing to serve you.

MONSANTO CHEMICAL COMPANY, St. Louis, U.S.A.

MONSANTO CHEMICALS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

F.T.C. ACTIVITIES

Complaints

Illinois Herb Claims Cited

Misrepresentation of forty medicinal preparations is alleged charged against Charles A. Bilgman, trading as Illinois Herb Co., Chicago.

The complaint alleges that "Calexa Herb Compound" and "Sonada Tonic," represented as cures or remedies for digestive ailments, have no therapeutic value in excess of temporary relief afforded by their laxative properties, and use of the word "tonic" to designate "Sonada Tonic" and "Verbita Tonic" is misleading in that these preparations have no substantial therapeutic value as tonics.

The complaint charges that "Lura," advertised of value in halitosis, has no effect upon that condition other than to mask it temporarily; that the value of "Rexora Herb Compound," represented as a remedy for bladder weakness and irritations, is limited to such slight relief for bladder irritations as it may afford because of its properties as a weak diuretic, and that "I. H. C. Dorelle Hair Tonic," advertised as capable of stimulating hair growth and preventing falling hair, has no value in stimulating hair growth, or in preventing falling hair except as it may assist in temporary removal of dandruff scales.

The complaint further alleges that advertisements of "Wahoo Bark," "Geroca Herb Compound" and "Trilax Herb Tea," constitute false advertisements in that they fail to reveal that use of these preparations under conditions prescribed in the advertisements or under usual conditions, may result in serious injury to health.

Orders

Texas Wonder Must Stop

E. B. Hall, trading as E. W. Hall, St. Louis, has been ordered to cease representing that "Texas Wonder" is a cure or remedy for inflammation of the bladder or kidneys, stones in the kidneys, tuberculosis of the kidneys, or any other bladder or kidney disorders, or for diabetes, rheumatism, swollen joints, weak or lame back, pains in the back, or lumbago.

The order also directs respondent to discontinue advertising that the preparation possesses any therapeutic value in the treatment of any of the ailments mentioned, in excess of such slight symptomatic relief as it may afford in cases of swollen joints and pains in the back, because of its mild diuretic properties.

ReVigator Must Stop

The ReVigator Corporation, Cleveland, and its president, E. O. Loeber have been ordered to cease misrepresentations of "ReVigator Pressure Cap," either alone or in combination with "ReVigator Liquid Home Treatment for Scalp and Hair," and "ReVigator Liquid Shampoo."

Commission findings are that the respondents, in advertising "The ReVigator System of Home Treatment for the Scalp and Hair," represented that use of the pressure cap provides a cure or remedy for falling, fading and thinning hair, and for dandruff and baldness, and a means of making new hair grow. However, according to findings, the use of this cap, alone or in combination with the respondents' preparations, will not accomplish the results claimed and the cap has no therapeutic value in treating such conditions in excess of cleansing the hair and scalp and temporarily removing accumulated dandruff scales.

George's Compound Stopped

Walker & Woodward, Inc., J. Lawrence Walker and T. Kyle Woodward, trading as Walker & Woodward, and Nick A. George and John G. Brown, Casper, Wyo. are ordered to cease disseminating advertisements which represent that "George's Compound" constitutes a cure or remedy for the specified ailments or conditions, or possesses any therapeutic value in the treatment of any ailment in excess of affording a stimulus to the flow of gastric juice, a mild stimulus to the appetite, and a temporary and palliative relief from aches and pains.

Wrisley Order Modified

Upon order of the Circuit Court of Appeals, the F. T. C. modified its order of April 6, 1939 against Allen B. Wrisley Co., and others, Chicago.

Respondents are now directed to cease representing that a soap which does not contain olive oil to the exclusion of all other oils is an olive oil soap.

Respondent further is ordered to cease brand names "Olivilo," "Royal Olive Oil Pure", "Purito Olive Oil Castile," "Olive-Skin Pure Toilet Soap," or "Del Gloria Castile Made With Pure Olive Oil" or other similar brand names containing the word "Olive" or the letters "Oliv" to refer to soap the oil content of which is not wholly olive oil.

The prohibitions of the Commission's modified order are not to apply to the trade names or labels "Palm and Olive Oil Soap," "Palm and Olive Soap," and "Oliv-Palm Complexion Soap."

Stipulations

Patten Concentrates Stops

Patten Concentrates, Inc., in the sale of "Patten's Concentrates," consisting of dehydrated vegetable products some of which are fortified with vitamins and others with drug laxatives, agrees to cease representing that it manufactures or produces the products; that they are chemically or biologically analyzed and assayed at frequent intervals; that they are "correctives" and have any special health-giving or remedial value; that "Patten's Tablets Enriched with Vitamins A-B-D-G" will maintain a person's physical fitness; that its "Parsley-Garlic Tablets" are an effective remedy for high blood pressure or hardening of the arteries; that the use of "Ultra-Eleven Vegetable Tablets" is effective for treating anemia, loss of weight, arthritis and malnutritions, and to discontinue similar representations concerning these and other preparations.

The respondent further stipulates that it will cease disseminating advertisements which represent or imply that "Patten's Kelp Tablets" are in all cases safe or harmless; or which advertisements fail to reveal that the preparation should not be used by persons ill of lung diseases, chronic cough, goiter or thyroid diseases, except upon the advice of a physician; and which fail to reveal that if a skin rash appears, use of the preparation should be discontinued. The stipulation further provides that the advertisement need contain only a statement that the preparation should be used only as directed on its label, if and when the label either contains such a warning or specifically directs attention to a similar warning in the accompanying labeling.

Agnes MacGregor to Stop

Agnes MacGregor, Inc., Chicago agrees to cease using on labels or in advertising representations that any of its preparations will effectively cleanse enlarged pores, eliminate blackheads, be a proper treatment for all types of acne, penetrate into the second layer of skin tissue, remove crows feet, wrinkles or fine lines, nourish the skin, promote the growth of new hair, and correct dandruff.

Bilaphen Claims to Stop

Frank R. Waxman, Newark, N. J., in disseminating advertisements of "Bilaphen Tablets" on behalf of Victoria Chemical Company, Newark, stipulates that he will cease representing that the product will aid in relieving an upset stomach, unless limited to relief of the condition when due to constipation. The respondent also agrees to desist from advertising that Bila-

Staff Allen's

English Distilled Oils

Stafford Allen & Sons Ltd.,
LONDON, ENGLAND

CLOVE
LAVENDER
NUTMEG
ORRIS
PATCHOULY
PEPPERMINT
SANDALWOOD

The Markets of the world accord highest honors to these valuable distilled oils

AMERICAN REPRESENTATION BY

UNGERER & CO.

13 - 15 W. 20th ST., NEW YORK, N. Y.

Sales Branches
PHILADELPHIA
CHICAGO
BOSTON
ST. LOUIS
SAN FRANCISCO
LOS ANGELES
TORONTO

phen Tablets will cause the liver to return to normal functioning and will cause normal or natural movements.

Arthrene Claims to Stop

F. B. Allderdice, trading as Arthrene Co., Jacksonville, Fla., agrees to cease advertising that the product "Arthrene" produces circulation, reduces swelling, dissolves crystals or cleanses the blood of uric acid, and that it is an effective remedy or cure for arthritis, neuritis, sciatica, rheumatism or gout, or has any therapeutic value in the treatment of these ailments in excess of affording temporary symptomatic relief.

Seneca Specialties Claims

George A. Springstead, trading as Seneca Specialties, Geneva, N. Y., agrees to cease advertising that "Nova" will banish gray hair, or impart the original or former color or the exact shade desired, and to cease representing or implying by any other terminology that the product will have more than a slight coloring action on the hair. The respondent also stipulates that he will desist from representing that the use of Nova cannot be detected; that Nova is blended or balanced according to a French formula, and that the respondent is assisted by a staff of employees.

Kohler Antidote Agency Stops

Courtland D. Ferguson, Inc., Washington, D. C., an advertising agency, agrees that in the advertisement of "Kohler Antidote," in behalf of Kohler Manufacturing Company, Baltimore, it will cease representing that this product affords complete relief from pain; that it will relieve pain double quick, lightning fast, or quicker than other similar preparations, and that it is absolutely safe and has no bad after-effects.

Entromul Agency to Stop

N. J. Newman, trading as N. J. Newman Advertising Agency, Los Angeles, in disseminating advertisements of "Entromul" on behalf of Thomas J. McBride, trading as The Entromul Co., Los Angeles, agrees to cease representing that the preparation will have a beneficial influence on an excess acid condition of the bowels or colon and that it has any significant value in the treatment of simple mucous colitis.

Merz-Allium Claims

Merz & Co., Chemical Works, Inc., East Orange, N. J., will cease advertising "Merz-Allium" as being bactericidal and as being effective in treating colitis, intestinal catarrh, diarrhea, coughs, bronchitis, arthritis, rheumatism, sciatica, colic, influenza, asthma or tuberculosis. The respondent corporation also agrees to desist from advertising that results obtained from the use of its preparation are unobtainable from any other, and that Merz-Allium is recommended by the "d r u g l e s s profession."

Antiseptic Tar Hair Grower

Eva B. Smith, trading as E. B. S. Mfg. Co., and E. B. S. Co., New York, agrees to discontinue advertising that "Antiseptic Tar Hair Grower" will promote the growth of hair, possesses antiseptic properties, contains essential oils or vegetable oils, and will eliminate itching scalp or have any value in its treatment in excess of affording temporary relief. The respondent further stipulates to cease representing (1) by use of the word "eliminate" or similar words that the preparation is a remedy or cure for dandruff, and (2) by use of the words "antiseptic" or "grower" in the brand name, that it has antiseptic properties or will promote the growth of hair.

Link Chemical Claims

The Link Chemical Co., Emporia, Kans., agrees to discontinue advertising that "G-I-M-P First Aid" is a competent treatment for strains, sprains, muscular aches and soreness and has any therapeutic value in treating these conditions in excess of affording a temporary relief from superficial pains. The respondent also agrees to discontinue representing that the preparation is effective for treating colds; that it is effective for treating athlete's foot in excess of affording temporary relief from itching; that the preparation penetrates into the tissues and kills infection and that there is no other germicide possessing equal germicidal properties which is equally safe.

Nu-Gro and Nu-Hair Names Stopped

John A. Martin, Jersey City, agrees to discontinue the words "Nu Gro" or "Nu Hair" or any other words consisting of a combination of letters the resultant normal pronunciation of which simulates the words "New Grow" or "New Hair," as a name for his products.

Rahnous Claims Stopped

E. W. Rahn, Cleveland, agrees to cease representing that "Rahnous Capsules," "Rahnous Nasal Drops No. 1" and "Rahnous Nasal Drops No. 2," alone or in combination, comprise a competent treatment for colds, hay fever, rose fever, asthma, or catarrh, in excess of affording temporary relief from symptoms and the discomforts associated with these conditions; that either of the products is a specific, and that the product Rahnous Capsules is of aid in building body resistance or that it regulates the body.

Fernet Vittone Claims

E. Fucini & Co., Inc., New York, agrees to cease representing that "Fernet Vittone" is a tonic, unless the representation is expressly limited to its effect as a gastric tonic; that everyone requires a tonic, stomachic and digestive; that Fernet Vittone is an effective remedy for intestinal disturbances or has any effects beyond those of a laxative, stomachic and gastric tonic, and that "Acqua Fiuggi" is an effective remedy for gallstones, kidney troubles, gout, calculus of the bladder, defective blood circulation or excessive uric acid.

Modern Plant and Equipment Design

(*Continued from page 285*)

Greater safety: the environment stimulates alertness; contrast is given to safe and dangerous parts.

Increased cleanliness and order: cleanliness stimulates cleanliness, and order stimulates order.

Decreased maintenance: simple forms and masses are more easily cleaned; details are housed and kept dust free.

Increased display value: pleasant design impresses workers and visiting customers also; they are more able to comprehend the purpose of individual machines and the continuity of operation.

Improved morale: pride in being part of an organization which is sufficiently self-respecting to be pleasant.

These are positive results. They make sense in terms of dollars—and in terms of living.

Modernizing the Small Plant

(*Continued from page 287*)

and future needs, and second, the employment of competent, expert counsel outside of the organization.

In addition to the improvements already outlined, the following results which accrued from our modernization are very significant:

1. Our costs have been very materially decreased.
2. Our potential capacity has been greatly increased.
3. Greater efficiency and improvement in morals on the part of all employees is everywhere evident because of more pleasant and cleaner surroundings and atmosphere.

For better AMPOULE *filling and sealing*

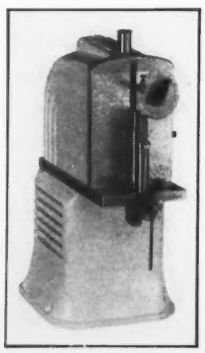
THE PerfeKtum *AMPSEAL*

PAT. APPLIED FOR

● For modern ampoule sealing the PerfeKtum Ampseal represents intensive research to develop a machine which would meet the rigid requirements of the industry. Entirely automatic, the ampoules are sealed by a pulling and twisting motion which forms a perfect seal. "Spot-fusing" creates a rounded seal. Adjustable in speed up to 1,500 per hour.

Users of the PerfeKtum Ampseal have found that it fulfills a definite need as it tends to speed up production with a minimum of loss due to mechanical sealing. Adjustable for handling ampoules of various capacities.

● A new stream-lined automatic-electric ampoule filling apparatus . . . for rapid and accurate filling of ampoules, vials and bottles. Will fill 800 to 1200 per hour. Exceptionally accurate predetermination of volume. Stainless steel construction. Improved final drop eliminator. Readily sterilized. The new PerfeKtum Ampfil is available in sizes ranging from the standard for filling ampoules up to 10 cc. plus, to heavy duty machines for handling volumes up to 500 cc.



The NEW **PerfeKtum** AMPFIL

(Patent No. 2150760)

Literature and complete information on request

PerfeKtum TRADE MARK REG.

PerfeKtum Products Co.

300 FOURTH AVENUE
NEW YORK, N. Y.
Cable Address: "Tantalum," New York

Materials of Modernization

(*Continued from page 303*)

WALLS:

Marlite, Celotex, Insulboard, Weatherwood, Service Tile, Linoleum, Plywood. Marlite was described in the introductory paragraph. This is available in the form of tiles or panels of various sizes. The panels are mounted in furring strips and fitted together with chromium strips. Celotex may be used in its natural color to conceal walls or it may be finished with paint as required. It has a very high insulating value and when used in its natural finish with appropriate trim, makes a very effective wall finish. Insulboard is a fiber and asbestos mixture smooth-finished with a coat of paint on one side and it may be used either for wall or ceiling finishes. The joints require pointing up with plaster before the finishing coats of paint are applied. Service tile is a form of glazed tile available in a variety of colors. Unlike ordinary tile, this tile is not smooth. It has a more or less rippled finish. It is used extensively for partitioning and in new construction for forming the interior course of masonry. Weatherwood is a gypsum board recommended for its high insulation value and it is mounted in a manner similar to Insulboard. Linoleum is being used for surfacing walls and it may be pasted directly to brick or tile work. Since it is obtainable in an immense variety of patterns and colors, it obviously offers a decorator a very wide latitude in working out a harmonious and practical scheme. Plywood or veneerwood is being very extensively used for wall finishes and for partitions. Whether stained or left in its natural state, it creates a serviceable and attractive wall finish. There is a form of plywood upon which a layer of metal foil has been laminated which is called Armorply. Copper, monel, and stainless steel finishes can be obtained in this material.

FLOORS:

Wood floors may be left in their natural color and finished with a lustrous polish known as the Tennant system. This material seals the wood and the cracks, and it furnishes a floor that is very easy to maintain with dry mopping. By the use of this system old wooden floors which have been painted or which have been scarified by constant use can be restored to their original condition. Wood floors never should be painted because the spots receiving the greatest amount of wear can never be retouched to match the surrounding areas. Wood floors can be covered by a great variety of materials. In office and laboratory areas linoleum may be employed in sheets or tiles. Asphalt, cork, rubber, and asbestos tiles also are widely used. The advantage of a floor which is laid in tile form is that an area damaged by excessive wear or by chemical spillage can be taken out and replaced. When floors are of concrete, it is possible now to obtain chlorinated rubber paints having great wear-resisting qualities. Concrete can be dyed with penetrating dies which also will withstand wear without changing, or it can be finished merely with priming materials intended to seal the pores of the concrete and to prevent dust. Finally concrete floors can be finished with melted paraffin which also is an excellent primer and which imparts a great degree of corrosion resistance against the majority of chemicals. When concrete floors have become badly worn, it is possible to refinish them with Terazzo. This material offers a very attractive and hard finish but it is also quite expensive. There are a number of floor finishes such as Stonehard which are intended for application over concrete or wooden floors. Various kinds of asphalt are used as floor finishes, especially over wood. These are resilient but are open to objection because of their black color and also because of their tendency to soften in hot weather.

HEATING AND VENTILATING:

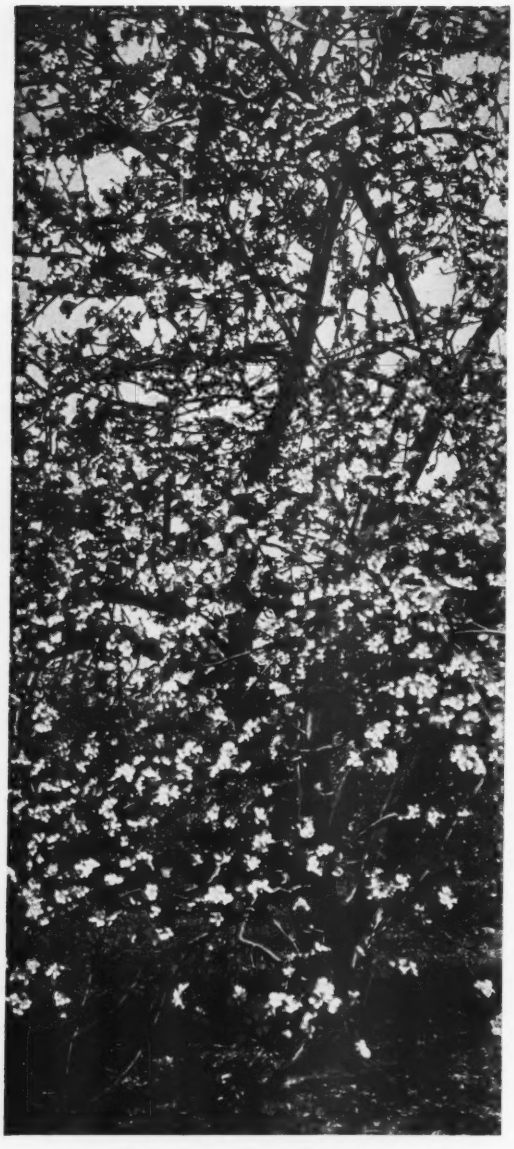
Modern construction dictates forced ventilation of one kind or another. This requires fans and a duct system and a means of diffusing the air. One of the most effective innovations in this field was the development of the Anemostat. This unit is mounted in the duct and it diffuses the warmed filtered air without drafts. When properly mounted, the Anemostat eliminates air pockets. Unit heaters generally are used in plants where outside ventilation can be provided. There are a great variety of these, some of them for office mounting are equipped with light outlets so that the same fixture serves the dual purpose of ventilating and lighting. Great changes have come about in the design of cast iron radiators and steel convector radiators recently have been introduced.

As we stated in the beginning, the materials selected for interior finish need not be the most expensive available. Good paint and lots of it is a good modernizer. It is possible to take an old interior and, by filling the cracks in walls and ceiling and finishing with good paint, to create a clean pleasing appearance. The paint permits the engineer to use very inexpensive finishing materials and to secure by the judicious use of color very striking effects at low cost.

Modernization at Merck & Co.

(*Continued from page 305*)

In the consolidation and moving of departments, reduction of handling and traveling distances has been a prime consideration. The paramount objective has been functional improvement, but more pleasant working conditions have been achieved both by design and as by-products. Scheduling has been geared to meet peak loads. Most orders are filled and shipped on the same day as received excepting those large orders placed in advance by distributors replenishing their stocks. The program is not complete. It is still in process, and will continue. Such are the stimulating effects of a modernization program.



SPRINGTIME and APPLE BLOSSOMS

will soon be here!

Perpetuate, throughout the year, the enchanting atmosphere of springtime by the adoption of ORBIS APPLE BLOSSOM for your extracts, colognes and cosmetics.

Just the right, light odor for spring and summer. Just the right odor to lighten the dark days of fall and winter. JUST THE RIGHT ODOR FOR EYERY SEASON.

APPLE BLOSSOM P
For perfumes and toilet waters.

APPLE BLOSSOM EC
For eaux de cologne.

APPLE BLOSSOM T
For powders.

APPLE BLOSSOM C
For creams, no discoloration. If you have had difficulty in masking the odor of lanolin, this product merits your consideration.

Prices and Samples Submitted on Request

ORBIS

PRODUCTS CORPORATION

215 PEARL STREET, NEW YORK - FACTORY & LABORATORY, NEWARK, N.J.

CHICAGO
831 N. Wabash Ave.

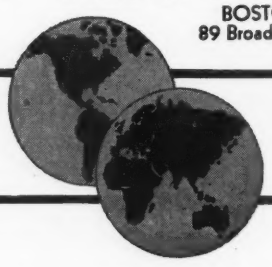
PHILADELPHIA
610 Brown Bldg.

BOSTON
89 Broad Street

CINCINNATI
505 W. McMillan St.

MEMPHIS, TENN.
1620 Carr Ave.

Water Soluble Gums	Waxes	Cosmetic Raw Material	Fruit Flavors
Thymol	Stearic Acid	Oleo Resins	Food Colors
Aromatics	Essential Oils	Perfume Bases	Quince Seed
Rice Starch	Zinc Oxide French	Olive Oil	Irish Moss



NEWS

Companies

Merck To Build In Virginia

To supplement manufacturing facilities of its chemical plants at Rahway, N. J., and Philadelphia, Merck & Co. will construct a plant in the Stonewall District of the Shenandoah Valley of Virginia, about three miles south of Elkton. The 312-acre tract is located between the Shenandoah River and the Norfolk and Western Railroad.

Among the features of the property is a mountain spring with a daily flow of more than a million gallons of cold water suitable for manufacturing purposes. Another advantage is that the proposed new plant will be located within the defense area suggested by the Government.

Initial plans include a power plant, a service building, a warehouse, machine shop and two manufacturing units for production of vitamins and other chemicals, some of which are important to the defense program in relation to the medicinal and health requirements of the nation.

The Company's plans also call for further expansion at Rahway where two factory buildings are under construction, in addition to the new analytical control building which is nearing completion. No reduction in personnel or operations at Rahway is contemplated. The Company now employs about 2,200 men and women and it is expected that the new Stonewall plant will provide work for about 300 employees.

Petrolager Adds to Plant

The Petrolager Laboratories has awarded a contract to J. E. Anderson & Son for the construction of a one-story fireproof addition to its pharmaceutical manufacturing plant in McCormick Boulevard, Chicago. The new unit will be 80 by 130 feet and is expected with its equipment to cost in excess of $50,000.

Hopkins Advances Dees & Van Nortwick

J. L. Hopkins & Co., New York, has announced the promotion of Wilmot E. Dees to the post of resident sales manager in which he will be chiefly concerned with the manufacture and sale of Hopkins' laboratory specialties, as well as general sales supervision of other Hopkins products.

Upon his graduation from the University of Michigan Mr. Dees became associated with Parke, Davis & Co., and eventually becoming assistant general manager. He left Parke, Davis in 1918 and for the next four years served as sales manager with the F. A. Thompson Co. (now C. E. Jamieson Co.), Detroit. He then became one of the founders of the Carpenter Chemical Co., Detroit, which specialized in the manufacture of bulk pharmaceuticals and operated through the manufacturing and wholesale drug field.

WILMOT E. DEES

Since 1937, Mr. Dees has been associated with J. L. Hopkins & Co.

John G. Van Nortwick, who has traveled throughout the United States and Canada for J. L. Hopkins & Co. for the past fifteen years, has been elected vice-president in charge of sales. He is active as a member of the membership committee of the American Pharmaceutical Manufacturers' Association.

Before becoming associated with J. L. Hopkins & Co. he was with the Albany Chemical Co.

Magnus Names Redding on Coast

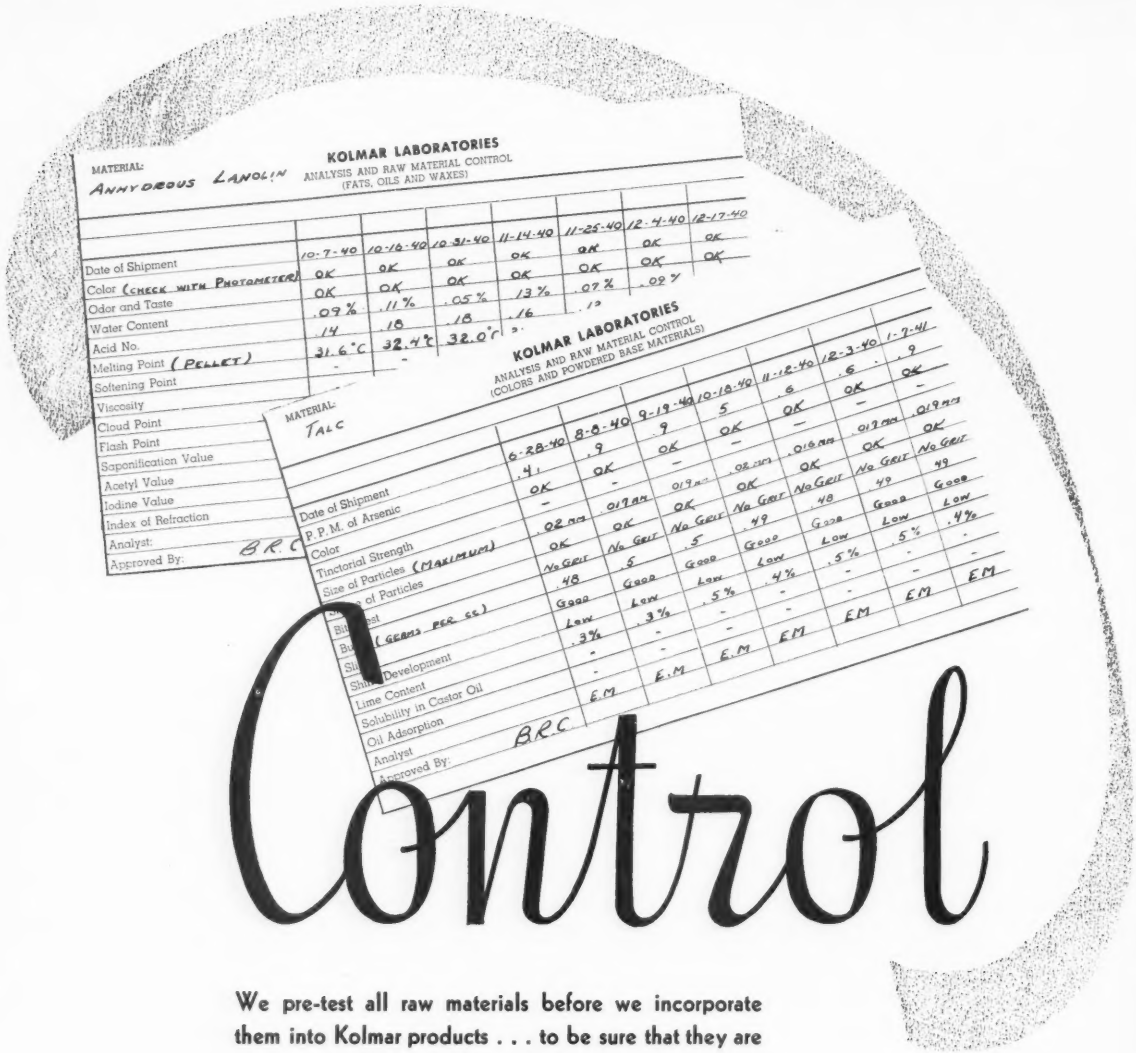
Magnus, Mabee & Reynard, Inc., has announced the appointment of Edwin Wright Redding, as manager of the Pacific Coast area. This appointment places Mr. Redding in charge of all sales activities for the important territory west of Denver. He has been active for the past twenty years on the West Coast, having represented Sharp & Dohme for fourteen years, the latter part of this time in an executive capacity, and prior to that being associated with the Owl Drug Co. Mr. Redding is a native of Colorado and a graduate of the University of Colorado with a degree in pharmacy.

EDWIN W. REDDING

New West Coast headquarters will be announced by Magnus, Mabee & Reynard, Inc. shortly.

Coty Buys N. Y. Building

The five-story building at 714 Fifth ave., New York, has been purchased by Coty, Inc. at a price estimated at $675,000.


KOLMAR LABORATORIES
ANALYSIS AND RAW MATERIAL CONTROL
(FATS, OILS AND WAXES)
MATERIAL: ANHYDROUS LANOLIN
Date of Shipment
Color (CHECK WITH PHOTOMETER)
Odor and Taste
Water Content
Acid No.
Melting Point (PELLET)
Softening Point
Viscosity
Cloud Point
Flash Point
Saponification Value
Acetyl Value
Iodine Value
Index of Refraction
Analyst:
Approved By: B.R.C
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.14 18 18 16 12
31.6°C 32.4°C 32.0°C
KOLMAR LABORATORIES
ANALYSIS AND RAW MATERIAL CONTROL
(COLORS AND POWDERED BASE MATERIALS)
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Tinctorial Strength
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Shape of Particles
Bulk
Bulk (GRAMS PER CC)
Slip
Shine Development
Lime Content
Solubility in Castor Oil
Oil Adsorption
Analyst
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.3% - - - - - .4%
- - - - - - -
E.M E.M E.M E.M E.M E.M E.M

Control

We pre-test all raw materials before we incorporate them into Kolmar products . . . to be sure that they are up to our inflexibly high standards. And, because of this testing . . . YOU can rely on Kolmar uniformity

KOLMAR LABORATORIES

MILWAUKEE • NEWARK

Manufacturers of private label brands, only.

Representatives

Mr. M. C. Boyd, Quinby Building, Newark, N. J
Mr. Douglas Haggerty, 122 E 42nd St., New York City
Mr. Warren Curry, 3950 Club Drive, Atlanta, Ga.
Mr. Norman Kole, 980 Merchandise Mart, Chicago, Ill.
Mr. R. F. G. Byington, 1260 N. Western Ave., Los Angeles Cal.

Magnus Entertains Gilpin

Following a custom of many years standing, the Henry B. Gilpin Co., wholesale druggist of Baltimore, Washington and Norfolk, assembled its sales force in New York for sales meetings. The series of meetings with prominent drug and cosmetic manufacturers was concluded by a dinner given by Magnus, Mabee & Reynard, Inc. at the Hotel Pennsylvania. In addition to "Joe" Ruppert, Gilpin sales manager, his sales staff and M.M.&.R. executives, other prominent guests included R. D. Keim, vice-president and sales director of E. R. Squibb & Sons, Inc.; Don Clement, sales director, Coty, Inc.; P. C. Brown, Mallinckrodt Chemical Works; Charles Poster, vice-president, American Spectacle Co.; Marvin Sherman, sales director, Youngs Rubber Co.; and William Barthman, sports writer and adventurer.

Speakers at the dinner were Mr. Ruppert, Percy C. Magnus, R. D. Keim and Mr. Barthman who showed color pictures taken on a recent Alaskan hunting trip. Earlier that afternoon the entire Gilpin sales staff was conducted on a tour of the MM&R building and laboratories by Arthur H. Downey, MM&R techmical department head.

Stokes & Smith Meeting

Representatives of the packaging department of Stokes & Smith Co. held an all-day meeting at the Philadelphia plant February 7. The representatives were welcomed by J. S. Stokes and Charles Evans and the meetings were in charge of C. E. Schaeffer and D. E. Maxfield. Representatives attending were: C. M. Bunn and Fred Tunelius from Chicago; R. L. Rogers, Jr., from St. Louis; W. B. Sanford and Jay Moreton from New York; H. E. Colburn from Rochester; and L. G. Smith and Paul Hagen of Phila.

Members of the engineering department headed by C. H. Nitsch, chief engineer, were all on hand to explain several new models of filling and packaging machines and the manufacturing department headed by L. W. Findlay, superintendent, the demonstrators and service men were also in attendance.

The meetings were followed by a dinner.

Durlin "Adherbase"

The Durlin Corp., New York, is offering "980 Adherbase," a specific formula lacquer for application either under or over nail enamel, serving as a prime coating or sealer. Adherbase is said to tend to make nail enamel doubly resistant to chipping and when used as a top coat to tend to make the enamel color resistant to alkali and other detergents.

Durlin has created four new colors to tie in with the new spring and summer fashion colors.

GILPEN SALES FORCE IN M.M.&R. LABORATORY

Baker Sales Convention

On February 12th to 15th inclusive, the sales force of the J. T. Baker Chemical Co. met for their annual sales convention at the plant at Phillipsburg, N. J., and at the Hotel Easton, Easton, Penna.

Ralph Clark, general sales manager, welcomed the field force, and then turned the meeting over to his three divisional sales managers, G. B. Hafer, of the laboratory chemical division, Charles H. Slater of the fine chemical division and John McAbee of the industrial chemical division.

The convention took the form of a sales clinic. Each field man had the opportunity to discuss the problems of his territory.

After each business session, the field force were entertained. Mr. and Mrs. Ralph Clark entertained the group at their home the first evening. The second night plant manager Foster Shook and Mrs. Shook promoted an evening of fun; while the final evening was given over to the company banquet held at the Pomfret Club in Easton, where covers were laid for sixty.

Luft Advances Haus

Mrs. Constance Luft Huhn, president of the George W. Luft Co., has announced that Harry A. Haus has been elected vice-president in charge of sales and advertising. Mr. Haus was formerly director of sales.

Brown Resigns from Lee

E. J. Brown has resigned after fifteen years of service with the Geo. H. Lee Co., Omaha. Mr. Brown's decision to resign was made in order to enable him to devote his full time to the Supreme Laboratories which was founded a short time ago and of which he is president.

Veve Hernandez Joins Hopkins

A. Veve Hernandez has joined the export department of J. L. Hopkins & Co., New York, where he will work under Charles A. Lotz, export manager. Mr. Hernandez, a graduate of the University of Rio Piedras, Puerto Rico, was formerly in the import and export business.

J. T. BAKER CHEMICAL CO. SALES CONVENTION

Biological Patent Rights

Announcement is made by Sharp & Dohme and the F. J. Stokes Machine Co., Philadelphia, that sole rights for licensing under their patents for vacuum desiccation from the frozen state have been granted to the Lyophile-Cryochem Co., a new corporation recently chartered under the laws of Pennsylvania.

Scientists of the University of Pennsylvania, engineers of the Stokes company, and the research staff of Sharp & Dohme have developed the commercial application of this process, which is said to be a revolutionary step forward in manufacture to produce greater stability and longer potency of biological and other labile products. In contrast, many such products as ordinarily supplied retain their value only for a short period of weeks or months.

By this process, moisture is removed under high vacuum from preparations that have been rapidly frozen so that only the dry substance remains in the final market container, which is then sealed under vacuum. When required for use, it is restored to the fluid state merely by the addition of distilled water. This process is now being employed to provide reserve supplies of human blood plasma ready for the emergency use of the Red Cross, Army and Navy in the treatment of shock, hemorrhages and burns in wars or disasters. Other preparations now made by this process for general distribution are 'Lyovac' Antivenin for the treatment of snakebite, black widow spider antivenin, antimeningococcic serum for the treatment of meningitis, antianthrax serum for anthrax, antitularemic serum for tularemia or rabbit fever, etc.

Licenses under this process have already been granted to several manufacturers. The Lyophile-Cryochem Co. will grant further licenses under the patents covering the lyophile, cryochem, and desivac arrangements of the vacuum desiccation process, and other modifications thereof covered by their patents in this field.

Officers of the new company are John A. Silver, president; Paul S. Pittenger, vice-president; Earl W. Flosdorf, secretary; F. J. Stokes, Jr., treasurer. The directors are John S. Zinsser, William L. Dempsey, Paul S. Pittenger, W. Logan MacCoy, John A. Silver, Earl W. Flosdorf, and F. J. Stokes, Jr.

Indalone Now Trade-marked

U. S. Industrials Chemicals, Inc. has announced the registration of the name "Indalone" as the trade-mark of the solvent, *a-a-Dimethyl-a'-carbobutoxy-dihydropyrone*. "Indalone," which was formerly marketed under the name "Dihydropyrone," was developed for use in liquid contact insecticides as a solvent for derris root extractives. It may be used in combination with another U. S. I. product, BK-5, for formulating lotions that combine sunscreening and insect-repelling characteristics.

Princess Pat Gets Patent

United States Patent 2,230,063 has been granted to Princess Pat, Ltd., Chicago, for its liquid lip color. Not only has the company patented the formula for its Liquid Liptone but it has also patented the applicator which comes attached to the bottle closure. The applicator patent is 2,158,901

Insulin Price Investigation

The Department of Justice has asked the appointment of a special grand jury to investigate the price of insulin and the control of its manufacture to see if a monopoly exists. Kenneth L. Kimble and George W. Wise, special assistants to the Attorney General are expected to present the evidence.

The inquiry is an outcome of examination of records of drug companies subpeonaed last June. At that time, on motion of Mr. Kimble and Mr. Wise, the District Federal Court issued more than 125 subpoenas calling for data on the manufacture, sale and distribution of drugs and medicinal preparations, surgical instruments, equipment and supplies, and cosmetics and toilet goods. In view of the size of this field, it is possible that the investigation will be extended beyond insulin.

Farm Chemurgic Council

The seventh annual conference of the National Farm Chemurgic Council will be held in Chicago March 26, 27, 28 at the Stevens Hotel. One of the speakers on March 27 will be Dr. Paul Kolachov, research director, Joseph E. Seagram & Sons, Inc., Louisville. His subject will be, "A Big Field of Small Items: Essential Oils, Spices, Drugs and Specialties."

Johnson—Continental Can Director

John L. Johnston, president of the Lambert Co., St. Louis, has been elected a director of Continental Can Co., New York. Mr. Johnston fills a vacancy on the board caused by the resignation of Michael S. Huffman, who was forced to resign because of poor health. Mr. Huffman, who made his headquarters in San Francisco, has also resigned as vice-president of the company.

Supple Joins Reynolds Metal

L. F. Supple, formerly president of the Springfield Glazed Paper Co., has joined the Reynolds Metals Co. as head of the Unifoil Division.

Butler with Snowtop Division

John J. Butler is now a member of the sales department for Snow Top precipitated chalk. He has been for several years with Industrial Chemical Sales, Division of the West Virginia Pulp and Paper Co.,

JOHN J. BUTLER, JR.

and before his transfer to the precipitated chalk division was with the alcohol division. Mr. Butler was recently elected secretary of the Salesmen's Association of the American Chemical Industry.

Associations

Record Drug Dinner

The sixteenth annual dinner of the Drug, Chemical and Allied Trades Section of the New York Board of Trade at the Waldorf-Astoria, New York, March 13, was attended by about 1,800.

The Honorable Paul V. McNutt, Federal Security Administrator, was the speaker and took as his subject, "The Drug and Chemical Industry and National Defense."

In addition to his duties as Federal Security Administrator, which include, among other things, jurisdiction of the Food and Drug Administration, Mr. McNutt has been appointed Defense Coordinator to formulate and execute plans, policies and programs designed to assure the provisions of adequate services in the fields of health, medicine, welfare, recreation and nutrition to the nation during the national defense.

The dinner this year was one of the most successful in the history of the section.

Chemists' Club Nominates

The nominating committee of the Chemists' Club, New York, has presented the following slate of officers for the year 1941-42: president, Walter S. Landis, American Cyanamid Co.; resident vice-president, Ralph E. Dorland, The Dow Chemical Co.; non-resident vice-president, Robert L. Murray; suburban vice-president, Per K. Frolich; secretary, Robert T. Baldwin; treasurer, Ira Vandewater, R. W. Greeff & Co.; trustees for a three-year term, Charles R. Downs and Albert B. Newman.

A.D.M.A. Convention

W. D. Barry, Mallinckrodt Chemical Works, is chairman and J. P. Remensnyder, Heyden Chemical Corp., is vice-chairman of the general entertainment committee for the thirtieth annual meeting of the American Drug Manufacturers' Association which will be held at the Greenbrier, White Sulphur Springs, W. Va., May 5 to 8.

Mr. Barry has announced the appointment of the following sub-committees: Golf Tournament, V. C. Williams, Monsanto Chemical Co.; chairman, J. H. Dietel, Merck & Co., Inc.; J. A. Huisking, Fritzsche Brothers, Inc.; Tennis Tournament, S. B. Penick, Jr., S. B. Penick & Co.; chairman, G. S. Furman, Merck & Co., Inc.; Banquet, F. J. McDonough, N. Y. Quinine & Chemical Wks.; chairman, M. N. DeNoyelles, Chas. Pfizer & Co., Inc.; Evening Entertainment, J. P. Remensnyder; chairman, R. B. Magnus, Magnus, Mabee & Reynard, Inc.; Ladies' Events, A. A. Wasserscheid, Mallinckrodt Chemical Wks.; chairman, George Simon, Heyden Chemical Corp.; James T. Pardee, The Dow Chemical Co.; Publicity, G. S. Furman, Merck & Co., Inc.; Transportation, Robert B. Magnus.

Salesmen's Luncheons

John J. Toohy, sales manager of E. R. Squibb & Sons, will be the guest speaker at a monthly luncheon meeting of the Salesmen's Association of the American Chemical Industry at the Waldorf-Astoria, March 13.

The meeting will precede the sixteenth annual banquet of the Drug, Chemical and Allied Trades Section of the New York Board of Trade of which Mr. Toohy is chairman which will also be held at the Waldorf-Astoria March 13.

Donald R. Belcher, assistant chief statistician of the American Telephone & Telegraph Co. will address the Salesmen's Association at its meeting April 8 on the subject, "Business Conditions and the Outlook." Major Al Williams, columnist and aviator will be the speaker at the meeting which will be held May 13.

BIMS Golf Dates

One hundred three members of the BIMS were on hand for the annual dinner which was held February 20 at the Hotel Lafayette, New York. The date for the next annual dinner was set for January 22, 1942.

The following schedule for the summer golf tournament was decided upon: May 15, Forest Hill Field Club, Bloomfield, N. J.; June 26, White Beeches Golf and Country Club, Haworth, N. J.; July 31, Sleepy Hollow Country Club, Scarsboro-on-the-Hudson; and September 18, Lakeville Country Club, Great Neck, N. Y.

Barry Heads Drug Club

The Drug & Chemical Club, New York, held a dinner February 20 in honor of the retiring president of the board of governors, H. B. Lamy, Jr. At the dinner the following members were nominated and elected to the following offices on the board: president, W. D. Barry, Mallinckrodt Chemical Works; vice-president, William J. Reynolds, Corroon & Reynolds, Inc.; treasurer, Joseph C. Hanson, Jr., Maiden Lane branch of the Chase National Bank; secretary, A. J. Smith, Zweig Smith & Co. Inc.; chairman of the house committee, F. A. Christensen, Continental Insurance Co.; chairman of the membership committee, J. J. King, Hooper Homes Bureau, Inc.; chairman of the art and entertainment committee, Robert B. Magnus, Magnus, Mabee & Reynard, Inc.; and chairman of the finance committee, H. B. Lamy, Jr.

WILLIAM D. BARRY

The following members retired from the board: Ralph W. McClintock of Mac-Lac Co., Inc. and F. L. Stallman, Stallman & Co. The vacancies caused by their retirement were filled by the election of Thomas R. Farrell, editor THE DRUG AND COSMETIC INDUSTRY, and Francis J. McDonough, New York Quinine & Chemical Works, Inc.

Re-elected for a second term on the board were: E. C. Otto, Chas. Pfizer & Co.; R. T. Marshall, Albert Wilcox Co., Inc.; J. J. King and W. J. Reynolds.

Victor F. Homberg is the manager of the club.

Chilson Addresses A.P.M.A.

An Eastern Regional meeting of the production committee of the American Pharmaceutical Manufacturers' Association was held March 7 at the Hotel Commodore, New York. Francis Chilson, industrial consultant and production editor of THE DRUG AND COSMETIC INDUSTRY was a guest speaker. His subject was "Plant Modernization."

W. O. Brewer, vice-chairman, Calco Chemical Co., Bound Brook, N. J., was in charge of arrangements for the meeting.

California Cosmetic Assn. Elects

The following officers have been elected for 1941 by the California Cosmetic Association: president Chris Nelson, Nelson Laboratories; vice-president, J. C. Nethercutt, Merle Norman; 2nd vice-president,

CHRIS NELSON

Henry Miller, Brunswig Drug; secretary, Mauro Herrera, Nourishine; treasurer, H. R. Schmidlapp, Shorr Laboratories. Four trustees were elected: Davis Factor, Max Factor; S. M. Reber, Everdry; Stephen Riley, Stephen Riley, Inc.; and Judge Smith, Sales Builders.

Olive Oil Dinner

The fourth annual dinner and entertainment of the Olive Oil Association of America will take place April 3 at the Hotel Astor, New York. The gatherings of the association have increased in importance each year as is shown by the fact that the attendance has risen to three or four hundred importers, packers and brokers.

Financial

Abbott Earnings Increase

Abbott Laboratories reports for 1940 record earnings of $2,239,408, equal to $2.89 a share on the 755,204 shares of common stock. This compares with a net of $2,048,094, or $2.61 each on 752,468 common shares in 1939.

Net sales last year increased 13 per cent. to $12,981,286 from $11,485,415 shown the year before.

Bristol-Myers Earns More

Bristol-Myers Co. reports for the three months ended December 31, 1940, a net income of $549,505.22, or 81 cents a share on the 676,173 shares of $5-par stock outstanding. This compares with a profit of $831,296, or $1.22 a share in the preceding quarter and $435,925, or 64 cents a share in the final quarter of 1939.

For the twelve months ended December 31, 1940, the net earnings were $2,523,642.13, or $3.70 a share, as compared with $2,379,785, or $3.49 a share in the preceding year.

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Com. Solvents Earnings Up

Commercial Solvents Corp. and subsidiaries report for the year 1940 a net income of $2,387,321, or 90.5 cents a share as compared to $1,600,389, or 60.7 cents a share during 1939.

In this statement to stockholders, Theodore P. Walker, president, said that provision was made for payment of Federal taxes of $691,168, against $249,531 in 1939, an increase of nearly 200 per cent. The corporation paid $27,930,317 Federal withdrawal taxes on products sold, against $19,764,107 during 1939.

Sales for the year amounted to $15,844,930 as compared with $14,480,937 the previous year.

Emerson Drug Earns Less

Emerson Drug Co. reports for 1940 a net income of $1,186,301, compared with $1,263,630 in 1939.

Lambert Earnings Up

The Lambert Co. reports for 1940 a consolidated net profit of $1,173,054, equal to $1.57 a share on 746,371 shares, against a consolidated net profit of $1,261,836, or $1.69 a share in 1939. For the December quarter the net profit was $290,675, or 39 cents a share, as compared with $187,911, or 25 cents a share during the last quarter of 1939.

Monsanto Earns More

Monsanto Chemical Co. reports for the year 1940 a net income of $5,519,289, equivalent to $4.04 a common share and comparing with $3.81 a common share in 1939. This represents an increase of 5.6 per cent. Domestic sales increased 18 per cent. reaching an all-time high of $45,607,600.

Net income before estimated income taxes was $9,027,659, compared with $6,395,025 in 1939. Estimated income taxes were $3,508,370, compared to $1,168,134.

Norwich Earns More

Norwich Pharmacal Co. and subsidiary report for the year 1940 a net consolidated profit before taxes on income of $996,521.61 against $939,886.07 in the preceding year. United States and Canadian taxes on income for 1940 are estimated at $238,638.96 against $156,603.86 last year. Owing to the increase in taxes of $82,035.10, the net profit for 1940 amounted to $757,882.65 as compared with $783,282.21 for 1939. The year's result was equivalent to 94 cents per share.

Gross sales for the year amounted to $4,559,587.29.

Parke, Davis Earnings Off

Parke, Davis & Co. reports for 1940 a net profit of $8,187,712. This is equivalent to $1.67 on 4,895,834 shares of no par capital stock and compares with a net profit of $9,254,202, or $1.89 a share earned in 1939.

Reed Drug Earns Less

Reed Drug Co. reports for 1940 a net income of $60,489, equal to 33 cents each on 116,545 shares of common stock and comparing with a net income in 1939 of $104,317, or 72 cents a share.

Sharp & Dohme Net Up

Sharp & Dohme Inc. reports for 1940 a net profit of $1,174,902, compared with $902,271 in 1939. For the December quarter the net profit was $292,946.

Stearns Earns More

Frederick Stearns & Co. and subsidiaries report for the year 1940 a net profit of $270,584, equal to $1.57 a share on 132,840 shares of no-par common stock, against a net of $170,072, or 81 cents a common share in 1939.

Sterling Products Net Up

Sterling Products, Inc. reports for the year 1940 a net income of $9,229,230, equivalent to $5.30 a share on the common stock and comparing with earnings of $9,140,026, or $5.25 a share, in the year 1939.

Vick Earnings

Vick Chemical Co. and subsidiaries report for the six months to December 31 a net income of $1,951,882, equivalent to approximately $2.86 a share on the outstanding stock.

Zonite Makes Profit

Zonite Products Corp. and subsidiaries report for 1940 a net profit of $114,606, including $26,525 for sale of patent. This is equivalent to 14 cents each on 825,656 shares of capital stock, excluding 19,900 shares held in treasury. This is contrasted with a net loss of $26,903 in 1939. Net sales for 1940 were $2,290,589 against $2,524,322 the previous year.

Obituaries

Warren E. Burns

Warren E. Burns, president of the Burns Florida Corp., Chicago, manufacturer of citrous products, died in Tampa, Fla., February 7.

Arthur F. Butler

Arthur F. Butler, managing director for R. W. Greeff & Co., Ltd., London, died suddenly February 7, according to cables received by R. W. Greeff & Co., New York. Mr. Butler had been associated with the London company since 1901 and was well known both in England and in America.

James R. Eller

James R. Eller, in charge of the Cincinnati office of Fritzsche Brothers, Inc., died suddenly at his home in Cincinnati, February 14. He was forty-nine years old.

He was born in Athens, Ohio, and moved soon afterwards to Columbus where he attended the Columbus schools. Upon his graduation from the East High School he entered the employ of the Pennsylvania Railroad where he remained until May 1925 when he joined the Fritzsche Brothers sales organization. He worked from the firm's Columbus office for several years until April 1939 when he was placed in charge of the newly opened Cincinnati branch.

Mr. Eller is survived by his widow, Mrs. Lulu L. Eller, a son, Walter M., and a grandson, William Reed Eller; his mother and stepfather, Mr. and Mrs. R. K. Dutcher of Columbus, and a brother, Ralph.

William E. J. Kirk

Dr. William E. J. Kirk, Street & Finney Inc., New York, died February 19. Before becoming associated with Street & Finney a few years ago Dr. Kirk was for several years medical director of Thomas Leeming & Co. He was a former president of the Medical Directors' Club.

Leslie Munn

Leslie Munn, engaged in public relations work for Calco Chemical Division of the American Cyanamid Co. since 1938, died at a hospital in Bound Brook, N. J., February 9. He was forty-nine years old.

Charles J. Westin

Charles J. Westin, chief design engineer for the F. J. Stokes Machine Co., died at his home in Philadelphia, January 29. He had been active in business up to the last few days but in poor health for some time. He was fifty-two years old.

Mr. Westin was born in Sweden and had been designing engineer for the Stokes company since January 1928, prior to which he was a member of the Government engineering staff at the Picatinny Arsenal. He was a former National Guardsman, a member of the Engineers' Club of Philadelphia and the American Society of Mechanical Engineers.

Mr. Westin had many inventions to his credit. His Westite Hermetic tube closure made it possible to close a collapsible tube with an air-tight and leak-proof seal that is now widely used in packaging. Other of his inventions are equally noteworthy, especially the development of automatic plastic molding equipment and tablet compressing machines for industrial service.

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As the speed of plant machinery soars, production costs go down—this is a fundamental fact that every manufacturer knows. However, manufacturers aren't impressed by speed unless they're sure of ***dependability***—high-speed machines must have the strength and ruggedness to stand the gaff.

This combination of ***speed and stamina*** is what makes our Model CM-2 one of the outstanding wrapping machines on the market today.

If you watch one of these machines in action, you'll get a new idea of real performance! Perfectly wrapped packages literally pour out the CM-2 at the rate of 250 to 380 per minute*... Yet it operates with the utmost smoothness and efficiency—no strain, no effort.

Designed to wrap comparatively small packages, the Model CM-2 is a decided improvement over former machines used for this same type of work. Extremely compact—measures only 4′ 3¼″ x 3′ 6″. What's more, it is easily and quickly adjustable for various sizes. Handles open boats containing loose articles, as well as regular cartons.

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PRODUCTION FORUM

By FRANCIS CHILSON
Production Engineer

After writing the Production Forum in this magazine for ten years, Mr. Chilson turns this month to a review of the situation as he has found it. Many problems have been solved, but there are many more awaiting solutions.

TEN YEAR REVIEW

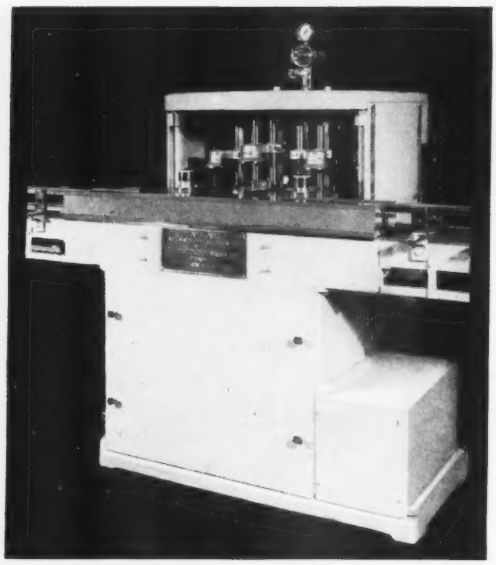
It has come to us as something of a shock that we are getting to be an old man. We've suddenly realized that this department has been sweated out of us for ten long years. In the main it has given us a lot of fun and it also has brought us a great many friends, some of whom we know only by correspondence. Of course it also has made a few enemies here and there among equipment people who have tried to high pressure us into publishing data on equipment which we regarded as junk. But our correspondence has shown that the department has been somewhat helpful even though we do make some tactless blunders.

The other day in looking back over the ten year period it occurred to us that you might like a compilation of some of the notions which still seem to have possibilities. This month's department, therefore, is a review. During the past decade we have been pleased to observe that on a number of occasions this department anticipated the need for new types of equipment and made prophesies that the oncoming years would fulfill these needs. In the section below headed "Necessities and Prophesies," certain predictions are tabulated and it is interesting to note that among these a considerable number have been developed.

EQUIPMENT ENCYCLOPEDIA

It seems a pity that there has never been published an encyclopedia of production equipment of all kinds. Such an encyclopedia would often be useful in locating equipment for a particular operation and in saving the cost of developing special equipment. In running around we have often been struck by the similarity of equipment employed in utterly dissimilar industries, and not less frequently have we come upon equipment which could be used in our own trade to better advantage than some of the equipment we are using. Up to now each industry has developed its own equipment and in so doing has duplicated equipment employed in other industries. This is wasteful; it also deprives the trade of the experience of the other industries in using that equipment. We do not mean to infer that the equipment now being used by the trade is any less efficient than that used in any other—much of it, indeed, is used in several trades already—;we are thinking more particularly of the unusual operation, the little kink in compounding, the annoying little twist in packaging operations, which we now meet with makeshifts or handle manually. There are, of course, many operations, such as grinding for instance, which are common to many industries, the nature of which will dictate the general form of the equipment. But there are many machines which are used for a given operation

DRY CLEAN YOUR *Containers*



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FIVE BASIC SANITAIR ADVANTAGES

1. DOUBLE CLEANING TIME
2. FLEXIBILITY
3. COMPACT DESIGN
4. SMOOTHER OPERATION
5. LONG LIFE

The Sanitair Automatic Rotary Cleaner is the most efficient means for air cleaning new containers. Compressed air is used as the cleaning medium in this machine, thus eliminating any trace of moisture in the cleaned container.

Containers are cleaned in this machine in an inverted position, assuring the removal of all foreign particles. The Sanitair does twice the amount of work in the usual amount of space, through the use of duplex cleaning stations, which are continuously and constantly in equal balance.

Although a complete change of all parts is very rarely required, it can be accomplished in ten minutes when necessary.

The Sanitair is an extremely flexible machine, and can handle a wide range of containers. Their filling openings may vary from the smallest AGST to the largest of wide mouth finishes.

A continuous and constant motion is used to invert the containers, insert and remove the cleaning tubes, and right and discharge containers from the machine. Through the use of these slow, continuously moving parts the Sanitair is assured an extra long life. Speeds up to 150 containers per minute are available on this machine.

For additional information and a bulletin describing the unit in complete detail, write for our Sanitair Bulletin.

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in one industry that can be adapted for dissimilar operations in other industries.

LAYOUT PROBLEMS

We wish that machinery manufacturers would include in their catalogs top-elevation drawings of every piece of standard equipment they make. These drawings should be scaled on the basis of ⅛″ or ¼″ to 1′, which is the scale usually used in making layouts. All such drawings should show intake and discharge belts, together with water, air, supply or steam connections as the case may be. As it is now one wastes an immense amount of time in correspondence with manufacturers, obtaining blue prints and specifications and other data which could be included in catalogs. If such drawings and specifications were included, one could make accurate templates and lay out a factory without having to worry that some gadget not shown or described in the catalog may force a last minute change in the layout when the new equipment is on the floor. P. S. Among a few other firms Pneumatic Scale is doing this.

THINGS WE'D LIKE TO SEE

We'd like to see packaging machinery manufacturers get together and do a little bit of collective standardization. We'd like to see them all adopt a uniform conveyor height as often as possible so that you could make a layout without having to block up some machines and set others into pits cut into the floor. We'd like to see them all adopt the same kind of transfer conveyor and to design it in such a way that a single line of conveyor belt could be run through all the equipment, thus eliminating dead plates. We'd like to see them all adopt a left-to-right construction so that all the machines in a line can be set on one side of the conveyor (most of them are so designed but there are still a few that do not conform). We'd like to see all the reputable firms work out agreements that would permit them to use each other's patented gadgets when the need arises.

This seems to us to be most important. Standard machines are designed for standard packages and there are no standard packages. Consequently the work of putting a line together is one of adaptation. You will find that Bill's machine would be perfect if only it had Sam's clamping mechanism. But Sam has a patent on that particular method of gripping packages and therefore you can go to hell and get along the best way you can. It seems to us that the start already made in this direction should be generally extended to all honest and reputable manufacturers, eliminating the chiselers. After all, it should be the general object of equipment people to subordinate their immediate competitive interests to the larger interests of the trades they serve. They cannot get along without us. We call to mind the case of a production man who wanted a packaging machine to do a certain job in a certain way. Certain equipment people who handle that class of work said it could not be done (by which they meant of course that they didn't want to do it because they could not think of a market for another machine like it, and could see no way of getting their development cost back again), so this production man, being a stubborn cuss, designed his own machine. Now he is faced with a suit because he infringed certain patents in getting what he wanted. Wouldn't it have been better for the equipment people to have said to him, "We can give you the machine you want, but our development overhead is necessarily high and we know damn well you wouldn't pay for it. Since you've got an idea go ahead and develop it yourself. We'll give you the right to use any of our patents for a small sum, provided you give us the right to sell the machine generally if it should prove successful and we can find a market for it." There are very few occasions when it is necessary to develop special machines, but there are thousands of cases where it is necessary to develop or borrow gadgets to improve the operation of standard machines.

FACE POWDER BOX ASSEMBLING

The assembling of powder boxes remains one of the unsolved production problems of the trade. This is still a hand operation and a comparatively slow one at that. At the present time there is no standard machine which will put a face powder box together after it has been filled. We have heard rumors to the effect that one of the big packaging machinery companies is working on such a machine. We wish them luck. Meanwhile we'll chip in a few notions we've garnered here and there. It wouldn't be much of a job to seal a face powder box mechanically if it were sensibly constructed like the Bourjois boxes for example. These boxes are shipped to the plant with the drum already cemented in and the cover on. The covers are not removed before filling; the boxes are filled through a hole in the bottom which is sealed with a plug held in place by means of a label. Inasmuch as this is a standard type of construction it wouldn't be much of a job to construct a machine which would deposit the plugs in the proper place, clean the box, and affix a suitable label.

Another type could be filled and sealed automatically on the same machine without using cement at all. We are thinking specifically of the Lily Cup which is so widely used as a paper container for ice cream, cheese, sandwich spreads and the like. In other words a face powder box could be constructed with a groove around the bottom forming a recess into which a paper board disc could be snapped. Inasmuch as machines for feeding discs and pressing them into place automatically are already available, the problem of making a combined filler and sealer is very simple. As a matter of fact there are combined fillers and sealers of this type on the market now but not yet for powder. Inasmuch as there might be some manufacturers who would object to the slight ridge around the bottom of the box, we must be prepared to give them what they want. So in

Have you read Frank Chilson's article starting on Page 274?

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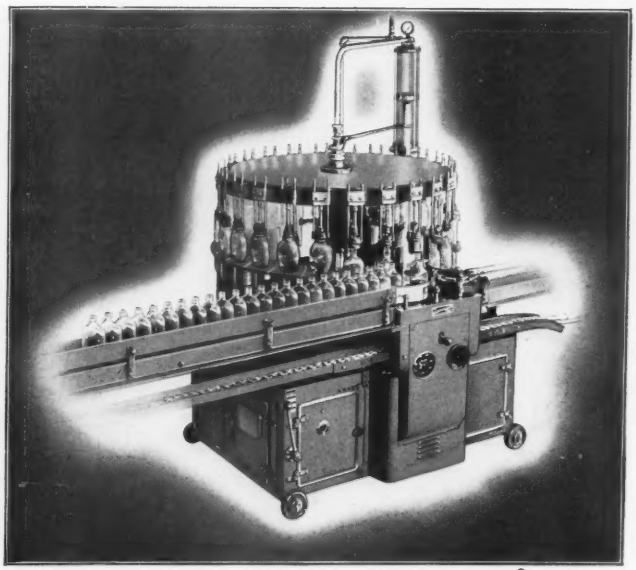

Yes, both these distinguished houses rely on these famous time-tested machines because they give large production neatly, accurately and at minimum cost.

Whether your product is light, heavy, foamy or syrupy, the Kiefer Automatic Rotary Vacuum Filler will do that filling job just a bit cleaner, just a bit faster, and for just a bit less money *every working day of the year.*

WE BUILD completely automatic . . . semi-automatic . . . hand-fed equipment to clean, fill, close and convey bottles, jars, tins and collapsible tubes.

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such cases the powder would be packed into a drum with a snapped in bottom and the drum in turn would be placed into a fancy box.

FACE POWDER MILL

Among the things we would like to see developed is a high speed, combination mixer and mill for face powder. We believe one could be made, as we have pointed out before, by using a revolving horizontal drum as a basis. With a central shaft in the drum fitted with hammers and driven at very high speed it should be possible to finish a batch without transfer. The hammers need not be long; they couldn't be, because the shaft and the hammers would have to be above the load in the drum. By equipping the interior of the drum with baffles, a small portion of the load would be carried up and dumped on the rapidly rotating hammers. Suppose you had a McClellan batch mixer with a set of beaters on a horizontal shaft, you can see what a beating the powder would get as it fell from one section to another. We have a feeling that this will be worked out very soon because mixers and pebble mills generally are too slow and pulverizers require premixing and offer some difficulties due to the variation of coloring materials. Given a constant weight of color or constant strength in a batch of face powder materials of constant weight and formula, the shade produced should match exactly in every successive batch. But since colors of such uniformity are not obtainable, there are minute variations of shade from batch to batch. Now if the mixer and pulverizer were one self-contained, high speed machine, you would be able to stop it and take samples for checking purposes, and you would be able to match shades exactly before the batch was discharged from the unit.

POWDER MILLING

Most of the dust involved in milling drug extracts or other powder such as face powder is made during transfer operations such as loading the mill, unloading the mill, transferring to the sifter and from the sifter to the filler. In a recent case it was necessary to design a self contained dustless unit that would overcome these difficulties. So a large pebble mill box lined with galvanized iron was built. In this under the pebble mill was placed a rectangular shaker feeder which consisted of a box with numerous openings in the bottom. Under this was mounted a rectangular box sifter equipped with a vibrator. Under this was placed a false bottom having a series of large openings, which corresponded to the size of an equivalent number of cans, which in turn were placed into a drawer below. In front of the mill box was a felt lined door which enclosed the entire unit. When the mill is dumped, the charge falls upon the feeder, which in turn feeds it down at a uniform rate into the sifter. It passes through the sifter through the holes in the false floor directly into the cans. When the operation is finished, the door of the mill box is open, the false floor is carefully brushed down to remove any siftings which might lie upon the ridge between the openings. Then the drawer truck containing the filled cans is drawn out and covers are placed on them. Each section of the unit is tapered on the under side in such a way that none of the material can get past the several sections. Each of these sections is designed so that by turning a couple of thumb screws, it can be removed for repairs. Tailings from the sifter are collected at one end and pass through small openings in the sifter directly into a special can in the end of the drawer truck. Such an arrangement eliminated dust and saves time. It can be utilized for larger mills as well.

NECESSITIES AND PROPHECIES

A combination blower and vacuum cleaner for cleaning process equipment, walls, floors, motors, etc. We have in mind a machine that will suck as it blows in a manner similar to bottle blowers. The industrial vacuum cleaners on the market do one thing or the other, blow or suck. The result is that if you blow out a motor or a powder mixer the entire atmosphere of the room becomes filled with dust, there being as yet no practical means of simultaneously collecting the dust dislodged by the blower. As vacuum cleaners, available machines are all right on smooth surfaces but are not so hot for cleaning brick walls. These machines usually depend on a brush to loosen the dirt so that it can be picked up by suction. This does not work so well on a brick or rough concrete wall where the brush cannot get at the dirt. It seems to us, therefore, that we should have a portable unit equipped with a suction fan and a compressed air unit operating independently but functioning through a combination blowing and suction head so that we can blow and collect the dust from recesses.

"Clean your bottles by air as you fill them" seems to be the general rule nowadays judging by the number of manufacturers who are doing it. Now we want to see somebody bring out a hand filler with a double set of nozzles: one for cleaning the bottles, the other for filling them.

We need a semi-automatic machine for cleaning bottles with air. *Note: We've got it now.*

We need a machine for depositing paper or foil discs on the surface of cream jars and ointment pats.

We need a machine which will feed, fill and close vest pocket tablet tins. *Note: We've got it now.*

We need a machine for depositing or inserting folded circulars.

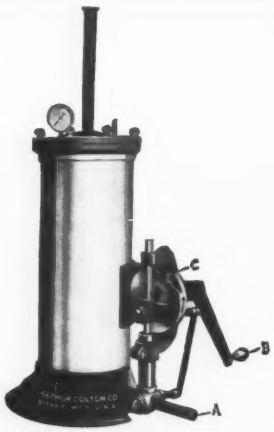
We need an adjustable wrapping device for cellophane and similar papers. *Note: We've got it now.*

We need a machine to fill tablets into bottles and insert a plug of cotton into the bottle and cap them. *Note: We've got the cottoner now.*

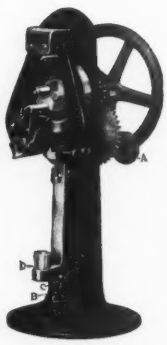
We need a good, semi-automatic cartoning machine which will be adjustable for a wide range of sizes. If we can't get this, give us a gadget that will set the cartons up and close one end. *Note: Coming.*

We need simpler and faster label coding and dating machines and we also need devices that can be at-

(Continued on page 333)



No. 3 Hand Paste Filler



Hand Tube Closer

Foot Power Crimper

Colton Hand Operated Machines

No. 3 Collapsible tube filler (hand operated) for tubes up to 1″ x 5½″ long.

Hand operated tube closer made in two sizes and styles to seal tubes with the Colton Clipless Closure or to seal tubes for applying clips.

Foot operated crimper for applying final corrugation to the closed end of the Colton Clipless Closure which gives it a decorative appearance as well as greater rigidity to the closed end of tube.

We also furnish this same machine without the crimping jaws for applying clips.

Our catalog No. 11 illustrates a variety of fillers and closers to suit production required. Please make us acquainted with your requirements and capacity, and we will be pleased to recommend machines best suited for your purpose.

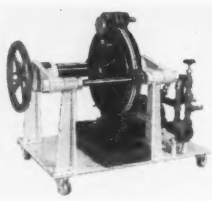
ARTHUR COLTON COMPANY

2620 East Jefferson Avenue Established 1884 **Detroit, Michigan, U. S. A.**

Speed'em-up!

WITH A HORM

Start the liquids flowing and keep them flowing fast—that's production! Horm helps you do just that—from drams to gallons through Horm Fast Filter to Horm Fast-fill Bottle Filler, and into the bottles.



Let Hormann graduate engineers solve your special problems of production. Write for catalog and FREE samples of Horm Asbestos Filter Sheets.

F. R. HORMANN & CO., INC.

127 Boerum Place *Equipment Engineers* **Brooklyn, N. Y.**

FILTERS TANKS MIXERS FILLERS

Here's what you'll like about the new

...''HAGERTY HANDY FILLER''

- Durable
- Moderately priced
- Eliminates spilling
- Simple to operate
- Convenient sizes
- Light construction

The most practical hand filler for creams, lotions and liquids.

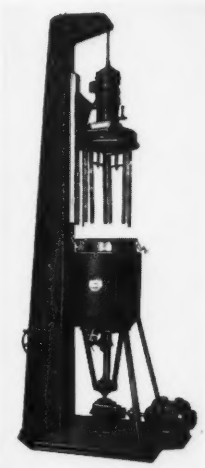
Write for illustrated folder and prices

HAGERTY BROS. & CO.

10 Platt Street **New York, N. Y.**

Est. 1849

A Complete Batch of Tooth Paste in 2 Hours from Start to Finish . . . . .



Stainless Steel Mixer with patented stator ring mixing mechanism in container and multiple blade scraper raised above it.

ABBÉ-LENART MIXER

ELIMINATES PREMIXING and then Grinding of Pastes, Ointments, Creams and Fats

Simply pour the powdered ingredients into the liquid vehicle and you get complete grinding and dispersion in one machine—a finished product of greater uniformity and better quality in less time. The Abbé-Lenart Mixer eliminates the need for separate machines to mill and mix; operation under vacuum removes the air from the mix so that there are no air bubbles or separation in the tubes. Material is quickly discharged under pressure, if desired.

Abbé-Lenart Mixers are built to meet your exact production needs, in any size from 1 to 330 gallons, for operation under heat or cold, vacuum or pressure. Built in any metal; they are quiet, fast, easy to clean and sterilize.

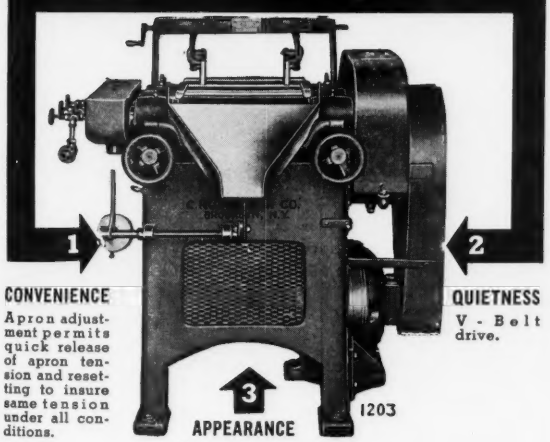
Write for Bulletin No. 48

ABBÉ ENGINEERING CO.
56 Church St. New York

ROSS 6"x14" THREE-ROLL MILL

NEW MODEL - MOTOR DRIVEN

Enjoy these added refinements



CONVENIENCE
Apron adjustment permits quick release of apron tension and resetting to insure same tension under all conditions.

QUIETNESS
V - Belt drive.

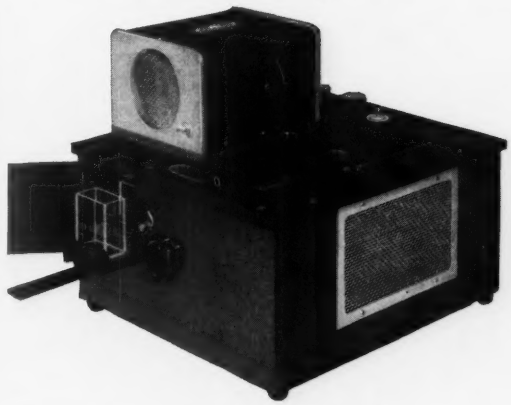
APPEARANCE
Improved frame.

Better than ever for fine color dispersion of lipstick bases; for milling shaving creams and tooth pastes; for grinding small batches of deodorant compounds and ointment bases.

Send for Catalog No. 10A

CHARLES ROSS & SON COMPANY
Manufacturers of Mixing and Grinding Machinery Since 1842
33 EMERSON PLACE BROOKLYN, N.Y. U.S.A.

Measures the Vitamins, Too!



A True Spectrophotometer

TRANSMITTANCY

The Coleman UNIVERSAL Spectrophotometer uses a spectrum grating and barrier layer photocell . . . with the range from 300 to 800 millimicrons. Transmission readings, for quantitative measure of substance in solution, may be made in any band required . . . by a simple setting of one knob! Base price $285.

COLOR

Color Curves of liquids are obtained through Transmission readings over the entire spectrum.

FLUORESCENCE

For Fluorescent work, such as the determination of Thiamine Chloride, Riboflavin, and others, a Mercury Lamp Accessory is available at $93.50.

For FLUORESCENCE Alone

Coleman FLUORESCENCE Meter. A single purpose instrument for fluorescent readings only. Combines a mercury illuminator, barrier layer photocell and electronic amplifier in one integral unit! Should be specified when the SOLE interest is the Thiamine or Riboflavin determination by the Fluorescence method, particularly in biological materials where small volumes are encountered. Lists at $200.

★ Authorized Coleman Distributor ★

★ Ask for Bulletin 204DC ★

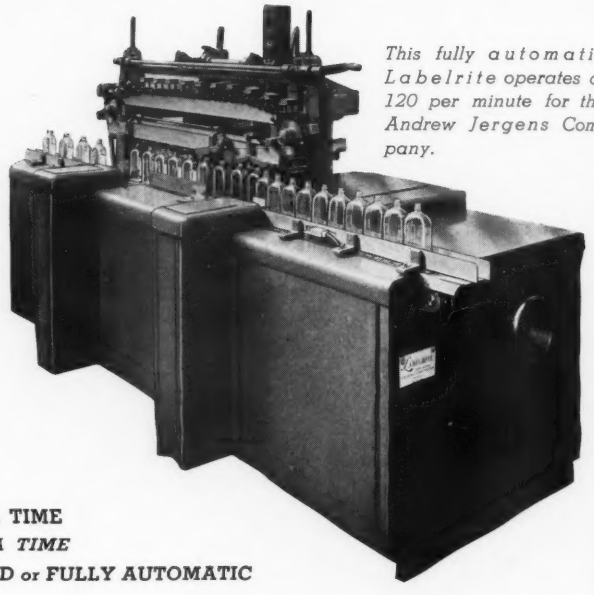
WILKENS-ANDERSON COMPANY
Laboratory Supplies and Chemicals
111 N. CANAL ST. CHICAGO, ILL.

MERCK

IS ONE OF THE MANY

DOING *Better* WORK AT *LESS COST*...ON THE

LABELRITE



This fully automatic Labelrite operates at 120 per minute for the Andrew Jergens Company.

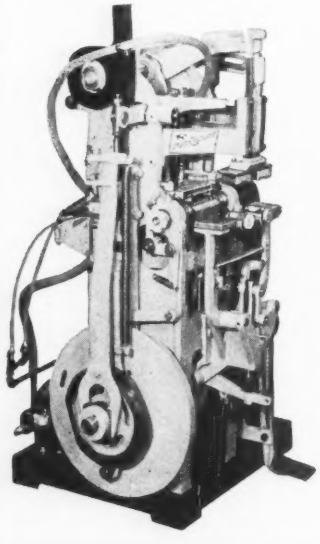
More than 550 manufacturing plants have installed over 750 LABELRITES since they were first designed in 1936! Their daily proof of time and cost saving over obsolete methods is their strongest recommendation.

- **NO NEED FOR WIPING OF CONTAINERS**
- **PERFECT REGISTER—ALL EDGES GLUED DOWN**
- **60 TO 240 LABELS PER MINUTE**

These outstanding features make Labelrites worth consideration, regardless of weekly production, for they take care of shapes and sizes of containers and labels with "petty-cash" cost of change parts, where more than one product is to be handled.

NEW! The "Two-at-a-Time" Pony Labelrite, hand feed with a capacity of 120 per minute, automatically ejects labeled containers.

ONE AT A TIME
TWO AT A TIME
HAND FEED *or* FULLY AUTOMATIC



AMONG USERS nationally known, are Merck & Co.; Sharp and Dohme; Norwich Pharmacal Co.; Colgate & Co.; Abbott Laboratories; Lehn & Fink; Bristol-Myers Co.; Harriet Hubbard Ayer; Revlon; E. R. Squibb & Sons; McKesson & Robbins; Bourjois; The Mennen Co.; York Pharmacal Co.; Joubert; Ciba Pharmaceutical Products Inc.; Johnson & Johnson; Pinaud; Purex Products; Smith, Kline & French, and many others as well.

LABELRITES are used for ampoules, bottles, jars, flasks, jugs, canisters and other containers as well as for labeling direct-upon-products!

Get FACTS—and you'll get Labelrites!

NEW JERSEY MACHINE CORPORATION

16th Street and Willow Avenue . . . . . Hoboken, N. J.

CHICAGO OFFICE, 549 WEST WASHINGTON BLVD.

● *Sales and Service Representatives in 14 Industrial Centres!* ●

(*Continued from page 329*)

tached to standard labeling equipment for code branding. (We already have dating attachments for labels and cartoners). *Note: We've got it now.*

We need a capper for feeding and applying long skirted caps. *Note: We've got it now.*

We've often wondered why the people who build coating pans do not design the stands so that the pans can be tilted forward to permit dumping the lots. Tumbling barrels used in the metal industries are designed in this way. They are mounted on stands at an angle of 45°; yet they can be completely discharged by turning a handwheel which tilts the barrels forward. It would be quite convenient to be able to tilt a coating pan forward to discharge the lots.

We prophesy that the process of grinding will be revolutionized and that the mills of the future will not depend upon impact or attrition but will achieve finer disintegration by the application of particle disruption or explosion. *Note: We've got it now.*

That the same principle, i.e., sudden particle disruption will be applied to the mixing of liquids.

That a way will be discovered to blow glass of two different colors in the same mold so that the manufacturer of the future will be able to buy machine-made ware with his name or crest embossed on the bottle in a contrasting color.

That a way will be discovered to form metal bottles by expansion somewhat as glass is blown.

That a way will be discovered to place decalcomania labels on machine blown bottles automatically before the bottles are annealed, and that this process will be carried on with very little increase in cost.

HOMOGENIZED ROUGE

We are thinking about a method of making rouge which we hope will result in a finer product. In brief, the method consists in mixing the rouge materials with water. This liquor is to be run through a homogenizer at a predetermined pressure. The resulting product is to be centrifuged or spray dried to remove the water and the rouge mass then granulated and pressed. We believe that such a process will produce a very fine rouge—fine in texture and fine in the uniformity of its color distribution. The processes of homogenization and centrifuging or drying can be made continuous and therefore costs should not be high. The setup includes a homogenizer, a centrifugal separator or a small drum or spray dryer and an oscillating granulator.

CAUSES OF SEPARATION

We are very much impressed by the paucity of knowledge in regard to emulsions. Many manufacturers are completely at sea when a preparation separates. The causes of separation are not so numerous, and some of them of course are due to physical reactions about which little is known. Among the causes we have encountered in our own experience are:

Decomposition: This usually occurs when mucilages, albumen and animal products are used as emulsifying agents, and is due to the lack of, or an insufficiency of, preservative.

Incompatibility: This occurs when the emulsion contains an ingredient which is incompatible with the emulsifying agent and causes it to precipitate. Borax in an emulsion containing gum acacia; mineral acids in emulsions containing albumen, etc. Another very common instance of incompatibility occurs in connection with an attempt to make an acid emulsion with a soap emulsifying agent.

Insufficient Dispersion: This is due to failure to reduce the oil globules to a very minute state. It is a deficiency caused by lack of adequate equipment. There are any number of emulsions that will separate on standing when mixed in the ordinary way but will stand up indefinitely when mixed rapidly, as for instance in a colloid mill or homogenizer.

Excessive Dispersion: This is the reverse of the foregoing and is due to such fine dispersion that the properties of the emulsifying agent are destroyed. This condition frequently occurs in connection with preparations containing vegetable mucilages.

Electrolytes: The presence of salts especially those of calcium, magnesium, aluminum, copper, iron, zinc, bismuth, mercury, etc., are likely to destroy emulsions, but in some instances very small quantities can be added after the emulsion has first been formed.

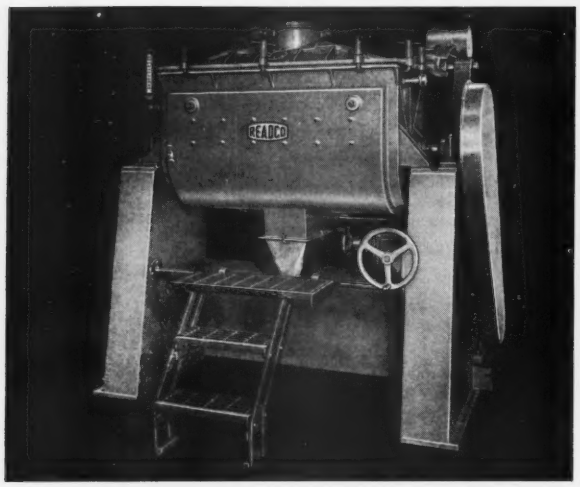
Temperature: Numerous emulsions will break if exposed to low temperatures; others will break if exposed to high temperatures. Emulsions containing soap are likely to be sensitive to cold; those containing animal products are likely to be sensitive to heat. Sometimes a temperature variation of twenty degrees one way or another will cause separation, as for instance, when emulsions are heated by attrition in going through a colloid mill, or by pressure in a homogenizer.

Insufficient Viscosity: Many emulsions will separate if not sufficiently viscous. This can be remedied by the addition of an emulsifying agent that will bring the viscosity up.

Improper Procedure: Some emulsions must be handled slowly; others must be handled rapidly. Some will require the making of a primary emulsion first which can be diluted after emulsification has been effected. Chemicals like phosphorus, sulfur, camphor, creosote, etc., cannot be added to the batch directly but if first dissolved in a fixed oil can be emulsified very readily.

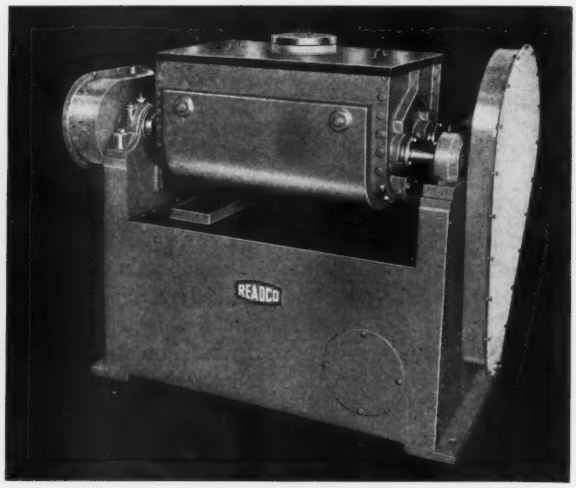
Failure to Distinguish Types: Attempts to add water to water-in-oil type emulsions or oil to oil-in-water types will cause separation. Many manufacturers fail to distinguish between these two emulsion types. They assume that because the emulsion contains more oil than water they can add more oil to it, whereas an emulsion can consist of ninety per cent oil and ten per cent water and still be an oil-in-water emulsion.

Improper Emulsifying Agent: No one emulsifying agent is suitable for all emulsions. The manufacturer



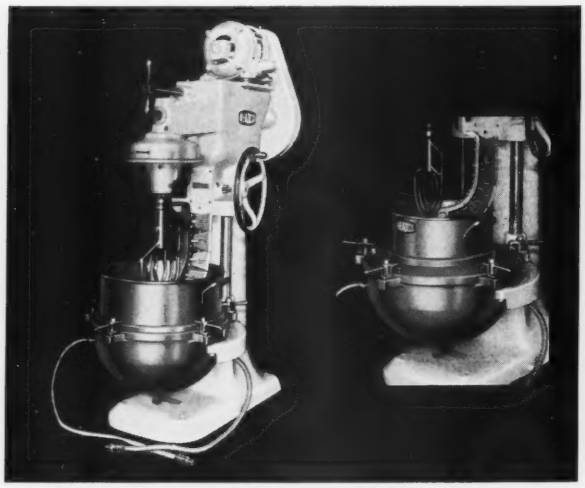
READCO Tablet Granulation Vacuum Dryer and Mixer

- Mixing and drying accomplished in one machine reduces waste and contamination.
- Vitamin properties are sustained by mixing under full vacuum, precluding oxidation.
- Hygroscopic granulations mixed under vacuum prevent moisture absorption.



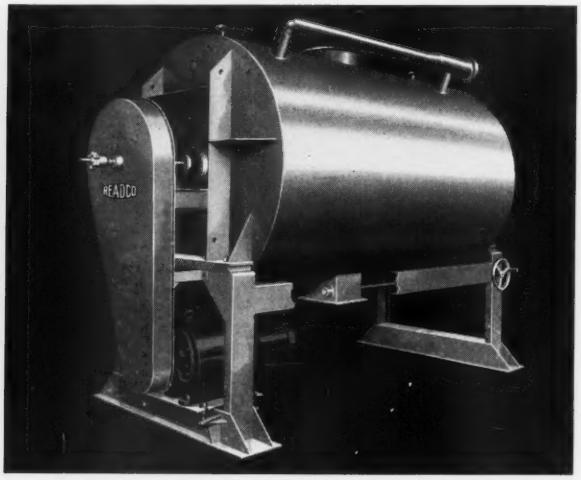
READCO Pill and Tablet Mass Mixers

- For incorporating ingredients into base of pill and tablet masses.
- Worm agitators produce uniformly smooth mix of proper consistency.
- Jacketed tank permits close control of temperature.
- Agitator design eliminates pocketing or pinching of material.



READCO Vertical Mixers

- Thorough emulsifying of creams obtained by planetary mixing action.
- Beater speeds entirely exclude air from batch.
- Convenient "centralized control" of speeds facilitates operation.



READCO Dreg Stills

- High rate of solvent recovery is obtained by action of rotating steam coils in steam jacketed cylinder.
- Close clearances eliminate build-up and increase rate of heat transfer.

Buy READCO and you buy PERFORMANCE

PROOF OF READCO PERFORMANCE

NORWICH PHARMACAL CO., Norwich, N. Y., has equipped modern plant with two Readco mass mixers, one Readco vacuum dryer and mixer, and Readco material handling equipment.

SHARP AND DOHME, Philadelphia, Pa., have modernized their production by installing two Readco mass mixers and one dreg still along with blenders and sifters.

READCO Drug & Pharmaceutical Equipment is designed and built for maximum performance. Mixers are built of ferrous or non-ferrous metals, carbon or special alloy, solid or clad steels—welded or cast. Material Handling Equipment is designed to fit the exact demands of the particular production problem. Call a Readco Sales Engineer to help solve your equipment problem.

READCO

Chemical Equipment

MATERIAL HANDLING EQUIPMENT • PILOT PLANT MIXERS • BLENDERS • BOTTOM DISCHARGE MIXERS • TILTING BOWL MIXERS • VERTICAL MIXERS • SHREDDERS • FABRICATED VESSELS • ACETYLATORS • PHARMACEUTICAL EQUIPMENT

READ MACHINERY CO., INC.,

YORK · PENNSYLVANIA

should know what emulsifying agents are best for his particular emulsion. Often a stable emulsion can be secured by changing its type, that is from an oil-in-water to a water-in-oil, an effect which can be secured by changing the emulsifying agent. Some materials are better emulsifying agents than others.

FILTERING

There appears to be more rule of thumb in regard to filtration than any other manufacturing problem. The invariable rule is that a plant making several kinds of products will have "standardized" on one type of filter medium. This is wrong. Although you can standardize your filtering equipment, you cannot standardize your filter medium because there is no such thing as a universal filter medium. What is suited to one product may be unsuitable for another. But so long as a clear filtrate is obtained most production men overlook the rate of speed at which the filtrate flows. Using the same filter medium for two products you may get a flow rate of twenty gallons a minute on one and only six on the other. Although the filtrate is equally clear and brilliant in both cases it is obvious that the cost of filtering one product is three times as great as the other. Unfortunately the data on filtering has never been collected and set down in concrete fashion for the reason that there are so many variables affecting this process such as viscosity, temperature, percentage and nature of foreign matter, type of equipment employed and the amount of pressure exerted by it, area of filtering surface, etc.

This would make an interesting and valuable thesis for a research worker who should find it possible to classify liquids by viscosity and by the nature and amount of foreign matter, so that a production man, even though lacking in general experience, could judge the efficiency of his own methods. It will pay those who investigate the matter to experiment with different types of paper, cloth and filter aids. You will find that a certain type of paper gives best and quickest results for one product; asbestos cloth for another, and possibly felt and some filter aid such as diatomaceous earth for still another. We'd like to hear from anyone who has made scientific studies on filtering; his views would be most welcome.

REVOLUTION

We don't aim to set ourselves up as a prophet but once in a while our random shots hit something. Remember when we said about a year ago that the problem of grinding seemed due for a thorough revision and that such revision would probably take the form of a pressure release application? Well, this revolution has come to pass. Right in our own trade this new principle has been applied to pulverization. Utilizing a combination of tremendous centrifugal force, pressure and the impact of particle upon particle, this new process will reduce particles of limestone as large as marbles to an impalpable powder continuously. No moving parts are employed; the particles of material disintegrate themselves. We saw this machine in operation. We saw stones go in and powder come out so fine that you could rub it between your teeth without any sensation of grit whatever.

NEW AND USEFUL

Often the department receives information which impresses us with the ingenuity of European machinery manufacturers who seen to beat us all hollow when it comes to creating gadgets and useful small machines. We probably have them licked on large units but if you want a handy little machine you're likely to find it much quicker in Europe than you will here. The department has just received a catalog from a firm in Vienna which specializes in drug and cosmetic equipment. Among the numerous units which impressed us were the following:

Mixer-sifter: This consists of a revolving drum mounted on a sheet metal receiving box fitted with a drawer. Inside the drum a spiral agitator fitted with brushes is mounted. The drum has a large hinged door about one quarter of the surface area which is used for loading and discharge. Inside of the door there are lugs for mounting a movable wire screen. The drum does not revolve but it can be turned over manually for discharging. To operate the thing you open the door and load it. Starting the motor, or turning the crank of the hand models, mixes the powder as it would in an ordinary powder mixer. But here's the difference: When the batch is mixed, the door is opened and the screen bolted in place over the opening. The drum is then turned over so that the screen is on the bottom and then the agitator is started again. This brushes the batch through the screen and prevents clogging. Thus a transfer operation is saved and the operation made considerably less dusty.

Laboratory homogenizer: Another item is a small, hand-operated laboratory homogenizer operated by means of a hand lever. Liquid is put into a hopper and pumped through a very fine aperture by means of the hand lever. The stream thus created is forced against a baffle resulting in a vortex which provides fine dispersion.

Water cooled molds: Still another item is a water jacketed mold for lipsticks and suppositories. This has connections so that a tube can be fastened to a water faucet and also outlet tubes for draining. You fill the mold and turn on the water, thus insuring quick chilling without handling the mold.

Also, an automatic tube filler and closer said to fill and close 1800 tubes per hour, which sets on a bench and is apparently a very neat piece of equipment . . . a combined tablet press and filling machine—it can be used for either purpose as required—another filling machine for powder which jolts the container as it fills in order to pack the product . . . a hydraulic suppository press . . . grinders . . . mixers . . . ointment mills . . . pill machines.

Follow thru the process of making most any "ideal" product and note how important a part the *method* of pulverizing plays. Whether it be simple particle size reduction or whether it demands a thoroughly blended, uniform finished product without specks, the method of pulverizing can spell success or failure.

Hundreds of nationally known plants today find the One Step Mikro-Pulverizer the final successful step to the "ideal" product. It generally accomplishes four operations in one.

Production costs are lowered—in some cases as much as two-thirds—dust is eliminated, a better product is obtained. Write for complete data.

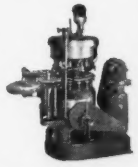
PULVERIZING MACHINERY COMPANY
108 Valley Road
Roselle Park, N.J.

NOW! Fill Containers To A
"Predetermined Level"

New Filling Machine CUTS COSTS! SPEEDS PRODUCTION!

Underfilled containers...hand finishing...overflow...smearing of jars, labels, belts and capping machines...you face all these problems UNLESS your Fillers automatically compensate for unavoidable variations in jar capacity.

The new FMC *Predetermined-Level* Filler fills containers to a *uniform level,* at speeds up to 100 or more 1 ounce jars per minute!



Eliminate the waste of over-filling—the customer dissatisfaction resulting from underfilling! Tell us the product and size of container and we'll send detailed information.

FOOD MACHINERY CORPORATION
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1—Cherry-Burrell No. 500 Viscolizer.
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1—Colton No. 14 Auto. Tube Filler, Closer, Clipper.
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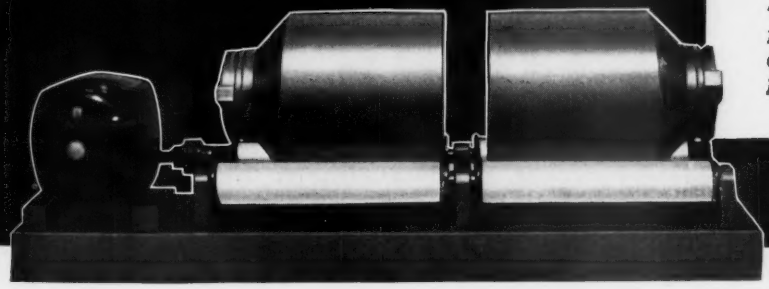

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BABY PREPARATIONS

Shampooing of the hair is best achieved with a good grade of soap adjusted to contain the absolute minimum of alkalinity on hydrolysis in water, or by the use of one of the newer soapless detergents. These are very pleasant in use, do not produce scum in hard water, and their degreasing action may be overcome by applying a little baby hair oil or baby hair cream (either of which may be formulated on the lines of the emollient baby oils and baby creams already discussed).

The value of diaper rinses has already been discussed in the beginning of this article, and the use of sodium hexametaphosphate for this purpose is recommended. The *p*H of the ordinary grade of *Calgon* is about 7.2 in dilute solution, and for use with soap the solution is rendered alkaline with sufficient sodium carbonate to bring the *p*H to about 8.5. This grade is termed *Calgon L.* Approximately 0.35 gram is required per gallon per degree of hardness. Based upon a very hard water of 20° this would require some 7 grams per gallon, which appears a suitable general amount for household rinsing. This can of course be supplied in solution form for use and marketed as diaper rinse.

The cult of sun bathing often results in the exposure of infant skin to excessive ultra-violet light, with dire results. There would appear to be a potential market therefore for a non-toxic, non-irritant sun screen suitable for infant skin which would pass only about 10 per cent. of the total rays in the active light region and which could be incorporated in a suitable cream base, such as some of those already described.

Powders act on dry skin as sedatives and cooling preparations, radiation of skin heat taking place through their many-edged particles. For this reason they are probably the most widely used of baby preparations. Formerly fuller's earth was a favorite old-fashioned remedy, but Wescott has drawn attention (*Extra Pharmacopoeia*, 20th ed., *1*, 138) to deaths of infants when this substance has been applied in an unsterilized state to sores on the naval and nates. Boric acid (2-4 per cent.) is usually mixed with talc, kaolin, starch, etc., and supplied for this purpose.

Zinc stearate possesses valuable adherent properties and is considered to give better protection against infant urine. There have been criticisms of the use of this substance in baby powders (although calamine is a favorite ingredient), and if desired magnesium stearate may replace it. Lycopodium (the spores of the common club moss), which contains about 50 per cent. of fixed oil consisting chiefly of lycopodium-oleic acid with some glyceryl myristate, resists moisture, is soothing, and is often employed in such powders.

Baby powder constituents such as talc, kaolin and precipitated chalk should preferably be heat-sterilized to avoid any dangers of bacterial spore contamination. For absorbent action kaolin and starch are superior to talc and chalk.

	parts
Boric acid	100
Starch	100
Purified talc to	1,000

	parts
Boric acid	100
Zinc oxide	100
Kaolin	500
Magnesium stearate	50
Purified talc	250

	parts
Purified talc	500
Kaolin	200
Magnesium stearate	50
Boric acid	100
Starch	150
Calamine	250
Starch	500
Boric acid	200
Zinc stearate	50

These powders, or variations of them, are prepared by simple mixing.

A word on packaging: broncho-pneumonia may be produced by inhalation of such powders by children sucking the top, to see that a closed sprinkler top is fitted and any enamelling on the containers carried out with paints, paints and inks that are harmless as possible. Sharp edges should be avoided. *R. G. Harry, Manuf. Chem.*

VITAMIN B INCOMPATIBILITIES

Louis Greengard ("Journal of the American Pharmaceutical Association," 1940, 6,) discusses the incompatibilities of thiamin chloride (vitamin B_1). Aqueous alcoholic solutions of thiamin chloride, he points out, precipitate as thiochrome upon standing at room temperature for several months. For this reason elixirs of thiamin chloride should be prepared in such quantities as will insure its being dispensed and consumed by the patient within 60 days of preparation. Little thiochrome is stated to be formed at *p*H2, but formation is more rapid as *p*H nears 7. Since no elixir can be very acid, the *p*H must necessarily be close to *p*H7, and it follows that precipitation of thiochrome occurs. Thiochrome is practically harmless, but the patient is getting no thiamin chloride, but merely a pleasantly flavored inert drink. Physicians and manufacturing chemists appear to have accepted a wine base as the most satisfactory vehicle for administering vitamin B_1. This is due partly to the palatability of the ensuing product, but also to the greater stability of thiamin chloride in an acid medium. All wines contain a certain amount of tannic acid, however, which throws down the thiamin

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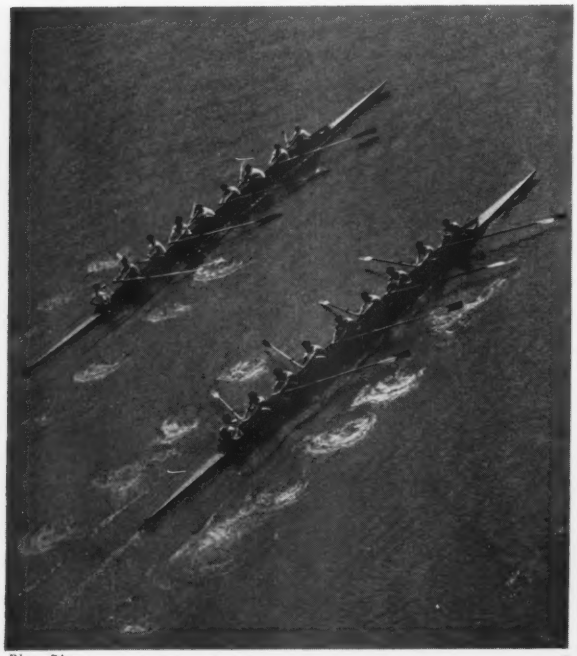

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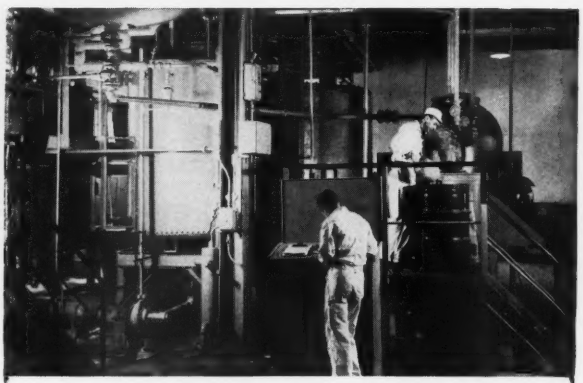

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chloride, probably in the form of a tannate. The pharmacist, in dispensing the preparation, is liable to decant the liquid, rejecting the precipitate; thus the patient gets wine with no medication. For this reason the wine should be detannated before adding thiamin chloride. This is done by using freshly prepared casein or completely defatted and de-albuminized milk. Aqueous or weak alcoholic solutions of thiamin chloride, upon standing, develop molds. This can be prevented by using 1/10 per cent. benzoic acid. Thiamin chloride is adsorbable by charcoal and kaolin, and therefore should not be administered simultaneously with either of these substances. It reacts to nearly all alkaloidal precipitants except bromides. Hydroxides decompose it, as evidenced by the yellow color produced. In most instances the solutions of thiamin chloride are dilute, and the precipitate does not develop for several days. Bromides of strontium and ammonium tend to be broken up by acids and acid salts, and therefore should not be dissolved in elixir thiamin chloride, but administered separately. The following is a summary of substances incompatible with thiamin chloride: Mercuric chloride, iodides, carbonates, bicarbonates and acetates (white precipitates); ferrous sulfate (yellow crystalline precipitate); tannic acid and iron and ammonium citrate (brown precipitates); iodine (reddish-brown precipitate). Sodium phenobarbitone produces a white crystalline precipitate, so that when phenobarbitone is desired in combination with the elixir, phenobarbitone itself, not the sodium salt, should be used.

COLLAPSIBLE TUBE CORROSION

Speaking generally, in the case of pure metal tubes the concentration of active materials present in cosmetics and pharmaceuticals is usually sufficiently so low as to make reaction improbable, or at least very delayed. When trouble does occur it can usually be traced to insufficient care in the mixing of the ingredients—*i. e.*, small pockets of pure reagent are left in the general mix. Nearly all preparations containing free stearic acid react slightly with pure tin, giving a neatly etched effect on the surface; but unless some other reagent of particularly corrosive nature is present the action stops at this and no more tin dissolves. Stearic acid in its solid form or as a neutral stearate does not seem to react with tin.

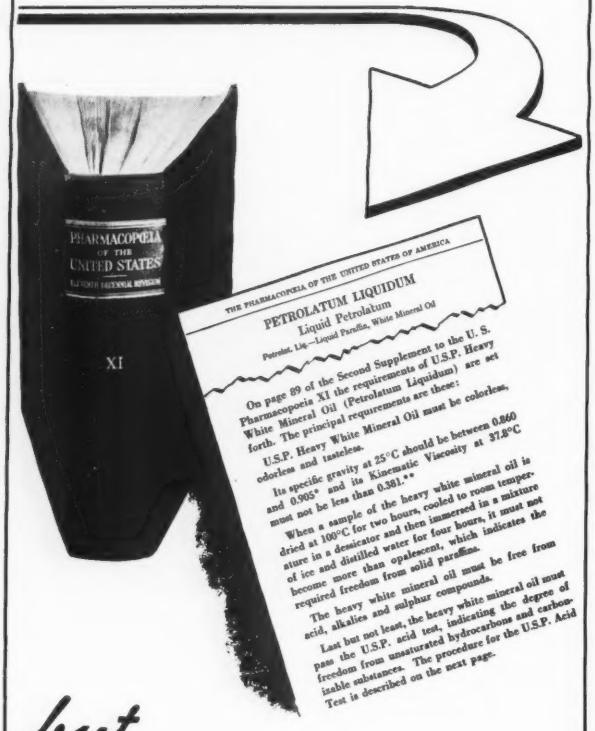
Dealing specifically with tooth pastes, Froboese proved that in tin-coated lead tubes it was possible to reduce absorption, and, of course, corrosion, by making the electrolytic conductivity of the paste as low as possible, and the writer endorses that view.

This question of corrosion of tin-coated tubes has been a sore point in the trade for years, and many patents have been taken out, such as pure tin nozzles, to reduce the blackening of white pastes. This, is only nibbling at the problem. As has been said before a pure tin nozzle will not prevent the blackening of the paste unless the tin-coating on the body of the tube is perfectly flawless. Either the electrolytic conductivity of the paste should be balanced appropriately or else the inside of the tube should be lacquered. Where there is any doubt the tube manufacturer should be consulted. Various lacquers and varnishes have been developed to resist attack from any preparation packed, and the method of application is improving rapidly to guarantee flawless cover of every tube. *R. M. Logan, Manuf. Chem.*

A large number of tubes of various ages up to ten years old packed with varying materials were collected and examined systematically.

Number Examined	*Contents*	*Type or Remarks*	*Condition of Metals*	
			Tin Tubes.	*Tinned Lead Tubes*
9	Shaving creams	Stearic acid	3 Etched	6 Blackened.
23	Tooth pastes	Alkaline	16 No corrosion	7 Little corrosion.
2	Tooth pastes	Neutral	1 No corrosion	1 Slight corrosion.
5	Vanishing cream	Stearic	2 Etched 1 Blackened 1 No effect	1 Total corrosion.
1	Cold cream	Grease	1 Perfect	—
2	Mud pack	Usual	No corrosion	—
2	Hand jelly	Glycerin	No corrosion	No corrosion.
1	Moustache fixer	Soap base	—	Tin partially dissolved.
2	Hand cleaner	Soft soap	—	Tin dissol ed. Lead blackened.
2	Hand cleaner	Abrasive	—	Lead blackene l.
2	Dental cleaner	Abrasive	—	Lead blackened.
1	Hair cream	Grease	—	No reaction.
2	Hair cream	Emulsion	—	No reaction.
1	Eczema blam	Camphor/eucalyptus grease	—	Lead blackened.
1	Pain balm	Methyl/sal./grease	—	Lead blackened.
1	Con. lub. jelly	Emulsion (phenolic)	Corroded right through	—
1	Con. lub. jelly	Grease base	No reaction	—
1	Menthol and wintergreen	Grease base	—	Lead slightly blackened.
2	Plastic wood	N/C base	—	1 No reaction. 1 Tin dissolved.
6	Ink	Oil base	No reaction	—
2	Ink	Duplicator	—	No reaction.
1	Lub. grease	Graphite	—	No reaction.
2	Rubber solvent	Usual	—	No reaction.
2	Adhesive paste	Dextrine	—	No reaction.
2	Liquid court plaster	N/C	No reaction	—
1	Fish paste	Anchovy	No corrosion but tarnishing	—
1	*B. coli* serum	0.5 per cent. phenolics	No corrosion	—
2	Depilatory	Sulphide	Corrosion in presence of air	—
2	Witch-hazel jelly	Glycerol base	No corrosion	No corrosion.

Your protection starts here..


PHARMACOPOEIA OF THE UNITED STATES
XI
THE PHARMACOPOEIA OF THE UNITED STATES OF AMERICA
PETROLATUM LIQUIDUM
Liquid Petrolatum
Petrolat. Liq.—Liquid Paraffin, White Mineral Oil
On page 89 of the Second Supplement to the U. S. Pharmacopoeia XI the requirements of U.S.P. Heavy White Mineral Oil (Petrolatum Liquidum) are set forth. The principal requirements are these:
U.S.P. Heavy White Mineral Oil must be colorless, odorless and tasteless.
Its specific gravity at 25°C should be between 0.860 and 0.905* and its Kinematic Viscosity at 37.8°C must not be less than 0.381.**
When a sample of the heavy white mineral oil is dried at 100°C for two hours, cooled to room temperature in a desiccator and then immersed in a mixture of ice and distilled water for four hours, it must not become more than opalescent, which indicates the required freedom from solid paraffins.
The heavy white mineral oil must be free from acid, alkalies and sulphur compounds.
Last but not least, the heavy white mineral oil must pass the U.S.P. acid test, indicating the degree of freedom from unsaturated hydrocarbons and carbonizable substances. The procedure for the U.S.P. Acid Test is described on the next page.

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Perfumers Shelf

OCTYL ALCOHOL DERIVATIVES

Among the numerous isomeric octyl alcohols at least two are of interest to the manufacturing perfumer. These are the normal octyl alcohol (or octanol) and ethyl hexyl alcohol (ethyl hexanol), both of which are available commercially.

Octyl alcohol, which has a boiling point of 191-4° C., and a specific gravity of 0.827, and a solubility of only 0.0586, is present in the essential oil of hogweed or cow parsnip (*Heracleum spondylium*), probably as the caproate. The butyrate has been reported as contained in the oil of the fruits of wild parsnip, *Pastinaca sativa* (which also contains the acetate), and in the rhizome of the male fern (*Dryopteris Filix-mas*).

The alcohol itself is sometimes used, to the extent of 1 to 5 per cent., for modifying bouquets and eaux-de-Cologne. It was synthesized a few years ago from normal hexyl bromide and ethylene oxide by the Grignard reaction in 70 per cent. yield. Under a pressure of 15 mm. it distils at 105° C.

The physical properties of the principal esters are as follows:

Octyl	*b.p.*	*Specific Gravity*
Formate	198	.890
Acetate	205-210	.884
Propionate	226	.883
Butyrate	242	.879
Valerate	260	.878
Caproate	275	.875
Heptylate	290	.876
Benzoate	307	.967

They are all insoluble in water, but mix readily with organic solvents and oils.

The formate, which is synthesized from octyl alcohol and formic acid, with the aid of hydrochloric acid gas as the condensing agent, has too pungent an odor for use in perfumery.

The odor of the acetate recalls that of orris, with a backing of jasmin and orange. Sometimes it is present in eaux-de-Cologne, the odor of which is said to enhance. Traces are put into synthetic rose, neroli, jasmin, and other perfumes.

The butyrate possesses a fruity odor, whilst that of the valerate is even more pronounced, and this octyl ester finds limited application in compounding essences.

Octyl benzoate is perhaps the most important of all the octyl esters, since it is a good fixative and has a softer odor than any of the others mentioned.

Octyl aldehyde, $C_7H_{15}.CHO$, occurs in some lemon, rose, and orange perfumes. The pure substance has a powerful sharp odor, boils at 175° C., specific gravity 0.821. It does not mix with water, but readily dissolves in alcohol and other organic liquids. *J. G. F. Drice, Manuf. Perf.*

SOAP ODORS

Neroli type odors for perfuming 100 kg. of soap each are made from the following combinations:

1.

Petitgrain oil, Paraguay	150 g.
Geranium oil, Africa	100 "
Palmarosa oil	75 "
Xylol musk, 100%	65 "
Beta-Ionone	60 "
Lemongrass oil, crude	35 "
Benzaldehyde, 100%	15 "

2.

Petitgrain oil, Paraguay	125 g.
Phenylethyl alcohol	100 "
Terpinyl acetate	100 "
Bergamot oil	50 "
Palmarosa oil	40 "
Methylnaphthyl ketone	25 "
Xylol musk, 100%	25 "
Amyl salicylate	25 "
Tolyl aldehyde, 100%	10 "

Fritz Schulz. *Seifensieder-Ztg. 67, 416 (1940).*

INDALONE

The name *Indalone* has been registered as the trade-mark of the solvent.—Dimethyl-'-carbobutoxy-y-dihydro-pyrone, it has been announced by U. S. Industrial Chemicals, Inc.

Indalone, which was formerly marketed under the name "Dihydropyrone," was developed for use in liquid contact insecticides as a solvent for derris root extractives. When used in this way, it has the property of increasing the insecticidal effectiveness of the ingredients dissolved in it and of holding derris extractives in solution in the commonly used base oils.

Indalone is a powerful insectifuge and repels the common winged insects to which it appears to have an obnoxious taste. Because of this high repellency it is especially suitable for cattle sprays and mosquito lotions.

Indalone may be used in combination with another U. S. I. product, BK-5, for formulating lotions that combine sunscreening and insect-repelling characteristics.

FLUORESCENCE METER FOR VITAMIN B_1 AND B_2

The LUMETRON Fluorescence Meter of Photovolt Corporation, 10 East 40th Street, New York City, is a photoelectric instrument for measuring the fluorescence of a solution as required, for instance, in the thiochrome method of determining Vitamin B_1 and in the method of D. B. Hand for determining Vitamin B_2.

For taking reflection measurements on solids, powders and opaque liquids, a special reflection search unit can be connected to the instrument.

ADVANCING THERAPY

SULFANILAMIDE LOCALLY

During the last year Key and his associates used sulfanilamide as a routine in contaminated wounds and in clean operative wounds with considerable damage to the tissues, when infection was especially feared or particularly undesirable and when foreign materials (bone grafts and wire or screws) were left in the wound. They suggest that the drug be sterilized before it is placed in the wound. Through studies on animals the authors find that powdered sulfanilamide slightly inhibits the primary healing of the wound but not to such a degree as to contraindicate its use in clean operative wounds. Its repeated use in open infected wounds does not seriously interfere with their healing. The authors feel free to implant sulfanilamide at will in clean operative wounds provided the powder is sterile. The powder should be crushed if it is lumpy after autoclave sterilization and spread thinly over the surface of the wound after hemostasis has been effected and just before the wound is sutured. Powdered sulfanilamide in a wound is similar to a test tube experiment in which a concentration of the drug of approximately 1,000 mg. is brought into contact with any bacteria which may be present. In such concentrations the drug is effective against small numbers of staphylococci and of Welch's bacilli, and against large numbers of streptococci. When it is considered that local infected lesions contain large numbers of bacteria growing in a favorable medium which contains peptone-like substances and that only a relatively low concentration of the drug is obtained by systemic administration of sulfanilamide it is obvious why such administration is not effective.

Campbell and Smith studied the prophylactic action of sulfanilamide on infection in fifty-four compound fractures including those with internal fixation. The results were sufficiently favorable to warrant further use of the drug. The cases of fractures are divided into three groups: fresh compound fractures, old compound fractures with a previous infection, and compound fractures with an active draining infection. In a portion of the first series, from 15 to 20 Gm. of sulfanilamide crystals was placed directly into the compound wound and the wound was closed without drainage. After twenty-four hours sulfanilamide was continued by mouth, from 15 to 20 grains (1 to 1.3 Gm.) every four hours. Of the ten cases of the thirty-five in the first group in which infection developed, cultures revealed Staphylococcus aureus in five, Welch's bacillus in three, Streptococcus haemolyticus in one and the organism was not recorded in one. These figures would suggest that sulfanilamide had a less favorable prophylactic action on staphylococcic and Welch's bacillus than on streptococcic infections. Sulfanilamide or azosulfamide was administered as a routine to the seven patients of the second group; the average dose was 8 Gm. of the former or 10 Gm. of the latter for from twenty-four to forty-eight hours prior to the operation and for from three to seven days after operation until there was no longer any danger of infection. No infections ensued in these seven cases. In the remaining twelve surgery was performed in the face of an active draining infection. The dosage of sulfanilamide, or azosulfamide, was similar to that administered in the presence of compound fractures with latent infections. Bacteriologic studies showed Staphylococcus aureus in three, Staphylococcus haemolyticus in two, Streptococcus haemolyticus in two, and the observations in five were not recorded. There have been no infections following internal fixation in ten; union has occurred in ten and it is too early for prognostication in two. In a number of the operative cases draining sinuses persisted for several weeks to months but the wounds ultimately closed and the bones united. In no case was it necessary to remove any of the plates, screws, nails or wires. The results in this group were the most striking of the entire series. Comparison with comparable controls shows better anatomic and functional results following internal fixation in conjunction with sulfanilamide than when internal fixation and sulfanilamide are not employed. The authors conclude that the present impression of sulfanilamide is favorable but that more extensive investigation must be carried out with sulfanilamide and other chemotherapeutic agents before accurate evaluation will be possible. *J. Bone and Joint Surgery, vol. 22, p. 952.*

SULFATHIAZOLE FOR PNEUMONIA

Gaisford and Whitelaw employed sulfathiazole in a series of pneumococcic lobar pneumonias and sulfapyridine for alternate patients as controls. Ten patients with true lobar pneumonia were treated with sulfathiazole. There were no deaths and only one patient had a complication, an empyema which was drained, with recovery. Among the nine patients who were treated with sulfapyridine there likewise were no deaths, but one patient developed a sterile serous effusion. Sulfathiazole acts similarly to sulfapyridine, but it produces a less prompt fall in temperature. With this temperature lag there is a correspondingly longer period of acute illness. This renders sulfapyridine the drug of choice in severe cases. The chief point in favor of sulfathiazole is that it does not cause vomiting. It is possible that a combination of sulfapyridine and sulfathiazole may come to be a valuable routine in the treat-

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ment of pneumonia, the first large doses given being sulfapyridine (e. g. the first 8 tablets) and the following ones sulfathiazole. In this way vomiting can be obviated entirely. An alternative is the use of a mixture of the two drugs from the outset, e. g. 2 tablets of sulfapyridine given with 2 tablets of sulfathiazole four-hourly for the first three doses and then one tablet of each. The first method has already been used since these investigations were undertaken with satisfactory results. *Lancet, vol. 2 (1940), p. 451.*

COLD PREVENTION

Baker and Cowan present studies on the incidence of colds among university students using amphetamine inhalers or a codeine-papaverine mixture and those employing a placebo for aborting colds at the first onset of symptoms. There were 279 students who used the amphetamine inhaler and 276 who used inhalers except that they contained no amphetamine but in appearance and odor were indistinguishable from those containing the drug. During the two years of the study the amphetamine group reported an average of 1.3 colds per person annually. This represented a reduction of 76 per cent. from the average of 5.5 colds per person annually which the same students reported for the two years prior to the study. The control group reported a fall from 5.1 previous colds to 1.9 colds per person annually during the study. This represents a reduction of 63 per cent. and certainly nullifies the apparent benefit given by the amphetamine inhaler. There was no difference between the two groups in number of days lost from school. The codeine-papaverine mixture was taken by 224 students and among them there was a reduction of 80 per cent. in the average number of colds per person annually during the two years of the study as compared to the two previous years as compared to the reduction of 63 per cent. for the control group. The results for the codeine-papaverine mixture, like those for the amphetamine inhaler, are not significantly different. An attempt to summarize the complications of the common cold which occurred during the period of the study, although the number is small, indicates that the codeine-papaverine group presented only about 50 per cent. as many complications as the amphetamine group, a previously vaccinated group or the control group. *Journal-Lancet, vol. 60, p. 453.*

INTRAMUSCULAR SULFAPYRIDINE

Sodium Sulfapyridine Intramuscularly. —Hall and his associates observed no local irritation or tumefaction after many deep intramuscular administrations of sulfapyridine. The clinical effects were equal to those obtained by other routes. Blood levels of from 3 to 10 mg. per hundred cubic centimeters were promptly obtained. Once the level is reached it can be maintained for longer periods than when given intravenously. Gastrointestinal reactions are almost entirely avoided, nausea does not occur and vomiting is seldom observed. This route may be found to be a safe alternative for intravenous injection in old persons with tortuous and sclerotic vessels, in infants, children and women with inconspicuous veins, or in persons with fat arms. The authors used a 33⅓ per cent. solution of sulfapyridine in sterile water, injecting it deep into the gluteal or thigh muscles. No material must be deposited in the subcutaneous tissue through the needle tract either on injection or during withdrawal of the needle. Each cubic centimeter of the solution contains 0.33 Gm. of the drug. From 6 to 10 cc. was given as the first injection and was followed by 3 cc. every four hours until the temperature had been normal for twenty-four hours. Thereafter the dose was reduced by one-half and continued for the next five or six days. This route has been use for pneumonia, undulant fever, appendicitis with peritonitis, abscesses, pyelitis, typhoid, gonorrhea, sinusitis and many other diseases. The authors state that the clinical results parallel those obtained by orally administered sulfapyridine. *Neb. State Med. J., vol. 25, p 398.*

DIETHYLSTILBESTROL

Between March 1939 and February 1940 Greenblatt and his associates used diethylstilbestrol for 79 patients requiring estrogen therapy. The routes of administration were parenteral, oral, vaginal and percutaneous. The dosages employed were as a rule aimed at symptomatic relief and not to test tolerance. Each of the various routes of administration has shown itself practical in maintaining a high estrogenic level. When administered parenterally its effect was not so sustained as that of estradiol benzoate. Eleven per cent. of the patients receiving diethylstilbestrol parenterally experienced some nausea. The oral route, with either plain or enteric coated tablets, proved unsatisfactory as more than 50 per cent. experienced undesirable side effects. Diethylstilbestrol dissolved in alcohol and used as a percutaneous rub, though not so effective, proved a convenient mode of administration. Undesired side reactions were reduced to a minimum. The most effective method of administration was vaginal suppositories. As little as 0.1 mg. in suppository form administered nightly to patients with menopausal syndrome frequently transformed the vaginal smear from castrate to a positive estrus in seven days with alleviation of menopausal symptoms. Although 26 per cent. of this group experienced side effects, they were never severe, amounting only to slight vaginal soreness or mild nausea. In most patients who exhibited side effects a tolerance developed when the dosage was reduced or its mode of administration changed. Stilbestrol was well tolerated and proved particularly efficient in the suppression of lactation. The drug is quickly absorbed and eliminated, and therefore medication should be tapered off slowly in the treatment of this condition. *So. Med. J. vol. 33, p. 1276.*

HISTAMINE FOR HEADACHE

Reid gave small repeated subcutaneous doses of histamine to 5 patients with neurovascular type of headache. One patient experienced only partial relief, while the other 4 obtained complete relief. Each patient, after the possibility of an intracranial pathologic lesion was excluded and the patient reacted positively to an intradermal test injection of histamine, was given graduated doses of histamine in the following manner: The solution used consisted of 1 mg. of histamine dissolved in 10 cc. of physiologic solution of sodium chloride. On the first and second days 0.05 mg. of histamine (0.5 cc. of the solution) was injected subcutaneously twice a day; on the third and fourth days, 0.075 mg. (0.75 cc. of the solution). Thereafter, up to the end of the third week, 0.1 mg. (1 cc. of the solution) was given twice a day. When this course was finished, each patient was given one injection of 0.1 mg. of histamine once a week. If the patient remained free from symptoms during the next two or three months, an attempt was made to decrease the dose by spacing the injections. If the symptoms recurred after the dose was diminished, the injections were again increased to one a week. The author applies the term "neurovascular headache" because there is fairly conclusive proof that the aura and pain in many complaints of head pain are due to a disturbance of the neurovascular mechanism controlling certain intracranial and extracranial blood vessels. Of the various patterns of this group, migraine is perhaps the best known. There are several other patterns which have a neurovascular mechanism, and some of these are as common as the classic migraine. It is emphasized that the use of histamine must not be regarded as a cure-all for every type of headache. Each case must be thoroughly investigated and only when all possibility of a pathologic lesion has been excluded should a neurovascular mechanism be considered. *Med. J. Australia, vol. 2 (1940), p. 307.*

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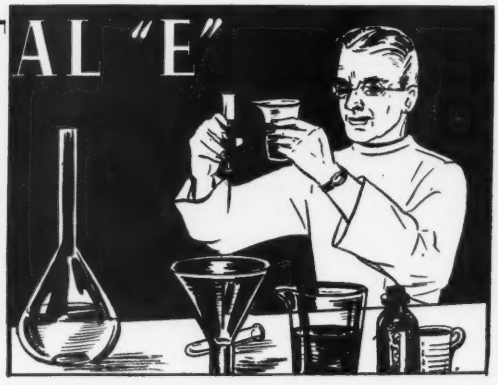

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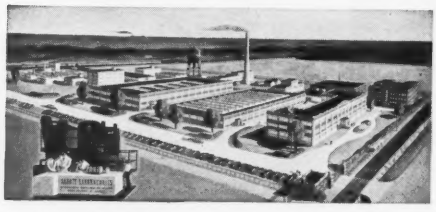

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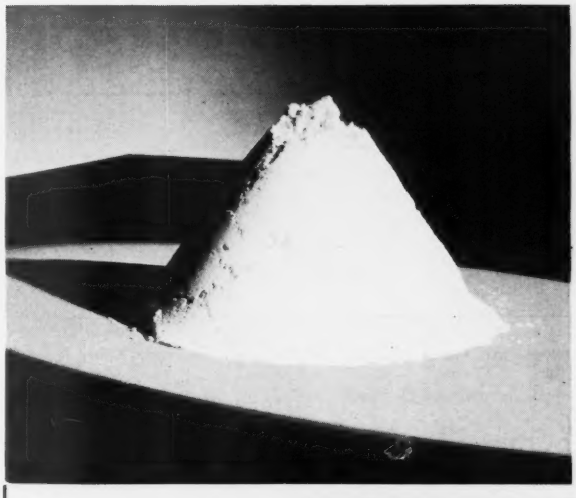

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NAIL POLISH: My raw material supplier suggested that you might be able to give me information as to what type of nitrocellulose is most advantageously used in nail polishes. I have been experimenting with the idea of using collodion but find that the other ingredients necessary are more or less obnoxious or undesirable in some way or another. Could you suggest a different solvent for collodion or would you advise some other cellulose derivative? New York City.

Collodion in an expensive and not altogether satisfactory grade of nitrocellulose for use in nail polishes. Nail lacquer problems are exactly the same as those met with in the manufacture of industrial lacquers. Enough nitrocellulose must be present to form a film holding resins and gums and pigments to make the desired coating yet at the same time the solution must not be too viscous for easy pouring. It is also usually advisable to cut the proportions of expensive solvents by the use of inexpensive diluents. Therefore, the starting point in nail lacquers is generally a low viscosity nitrocellulose in a combination of solvents having the proper boiling ranges to permit the formation of a good film. Resins are chosen to give hardness and luster, gums give adhesion, plasticizers make the film flexible; these are dissolved either in the solvent mixture or in the hydrocarbon diluent fraction. Pigments are often ground into the finished lacquer. After this review, we re-emphasize the advice we have given many times in the past that the formulation of a good nail lacquer is a very complicated matter which is best left to the private label manufacturers who have experimental and manufacturing facilities.

LIQUID SHAVING CREAM: Will you please furnish me with a formula for a white liquid lather shaving cream which I have been unable to make. Any information you can give will be greatly appreciated. Brooklyn.

We believe that any satisfactory shaving cream can be transformed into the liquid product you desire merely by adding sufficient water to make a product thin enough to pour from a bottle. If the resulting mixture is too transparent or not quite white enough, then it can undoubtedly be improved by using definite but small excess of stearic acid in the formula. The excess must be regulated so as not to reduce the lathering power of the preparation.

FLAVORING EMULSION: For some time I have been making an Acacia-tragacanth base for emulsifying essential oils that are used in flavoring essences for food. In a few hours the oil settles out and has to be shaken again before using. I take ½ oz. of a gum base and add 8 oz. of oil, shake well so that the powder is evenly suspended, then add 8 oz. of water and shake thoroughly. This makes a coarse grained emulsion that is anything but satisfactory.

The type I have in mind is the flavoring emulsion used in the food and confectionery industry. I would appreciate it extremely, if you can give me any advice on how to overcome my trouble. For a while I thought of trying a stearic acid cetyl alcohol combination but thought I would wait until I wrote you regarding the problem. Chicago.

Concerning the composition of your gum base, the boric acid serves no useful purpose since it is not an edible material and may well be omitted. There seems to be nothing wrong with the other components of the gum mixture or your procedure. You have the proper combination of gums and proportions of oil and water to give a reasonably stable emulsion. Undoubtedly the answer to your problem is the use of a homogenizer or colloid mill to break up the oil particles into such fine droplets that the oil will not separate.

I do not think there is any reason for making a soap emulsion such as you have in mind.

SHAVING CREAM pH: In taking the pH of a shaving cream, what is the proper concentration and temperature to use? Providence.

Temperature should be normal room temperature, in the neighborhood of 20°C. or the temperature of warm tap water, 50° C. I believe two determinations are useful in testing shaving creams, namely, one of the original cream and another of the cream diluted so that it approximates the concentration on the face. In other words, the pH of the original cream determines the effect if any, on the container, while the pH of the diluted cream at the higher temperature will give some measure of the effect to be expected on the razor blade and on the skin.

QUESTIONS

FACE PACK BASE: We have a medicinal product which we should like to incorporate in a face pack mixture to insure penetration through the skin. We should like the vehicle to be of good consistency comparable with one of the good clay packs on the market. It should not be sticky or stringy, should be easy to apply, and should have a toning effect on the skin. The mask should be dense enough so that the inside remains moist even after the outside has dried. We should very much appreciate any information that you can give us on this subject. St. Louis.

A good clay pack may be based upon bentonite. Additional ingredients include colloidal clay, powdered gum karaya and glycerin, proportions depending upon whether a powder or a paste is desired. An experimental mixture for first trial could consist of bentonite 50, colloidal clay 35, glycerin 5, karaya 2, water 8. The powdered materials are mixed together and the glycerin and water then stirred into the mixture. The product should be a substantially dry powder into which medicinal ingredients may be incorporated as desired. It must be mixed with water to form a paste before use. Or the mixture can be sold as a paste ready for use, by the use of more water and glycerin.

HEATLESS PERMANENT WAVE: Has the heatless permanent wave liquid now being used been discussed in Drug and Cosmetic Industry? I should like to get some idea as to the composition and probable action of a preparation of this type and whether the composition is harmless and effective. New York City.

The only discussion on preparations of this type that we have seen has been in the patent literature. Indications are that these are modified permanent wave or depilatory mixtures which act by softening the hair at low temperatures instead of high temperatures. After action has gone on for a while it is stopped and the hair is set in position. The relative harmfulness of these products and their effectiveness must therefore depend upon control in both manufacture and use. Undoubtedly, if all kinks can be eliminated these will become increasingly important.

WINTERGREEN RUB: We are interested in an alcohol rub containing oil of wintergreen for massage purposes. Can you help us out with a formula for a product of this type? Boston.

An alcohol rub such as you desire can easily be made by adding five per cent. or more of oil of wintergreen or methyl salicylate to an ordinary rubbing alcohol based either on specially denatured alcohol or isopropyl alcohol. A quite popular form of this product consists of a mixture of equal volumes of methyl salicylate and witch hazel which is shaken before use.

NAIL WHITE: I should like some information on the subject of nail white, specifically in reference to a formula given in "Modern Cosmetics." Can zinc oxide replace the titanium dioxide called for and what grade of stearic acid should be used?

I wish to use this preparation not as a nail paste but for marking tissues in the mouth and the paste should adhere to a wet surface. I would appreciate any information you can give me in this matter. Gloversville.

Zinc oxide and stearic acid should not be used in the same formula since they will react and the emulsion will break down. For this reason titanium dioxide, which is inert, is specified. Practically all cosmetic formulas mentioning stearic acid call for the triple pressed grade, which is the highest quality. In this formula stearic acid and mineral oil are melted together; triethanolamine, glycerin, and water are heated together and the melted stearic acid poured into the aqueous solution with stirring. Stir until cold and then grind the mixture with the titanium dioxide. Allow to stand overnight and stir to break up the hard mass formed. I believe this product should be quite satisfactory for the purpose you have in mind since the cream is an oil-in-water emulsion which should adhere to some extent to moist surfaces.

PAPAIN CREAM: I have been trying to locate a formula for a cream that calls for Papain as an ingredient. As a reader of your magazine, could you tell me in what amount and in what form this could be added to a face cream? Thank you very much for an early reply. Indianapolis.

I am sorry that we have not heard of the use of papain in creams nor do we think that this ingredient would serve any useful purpose.

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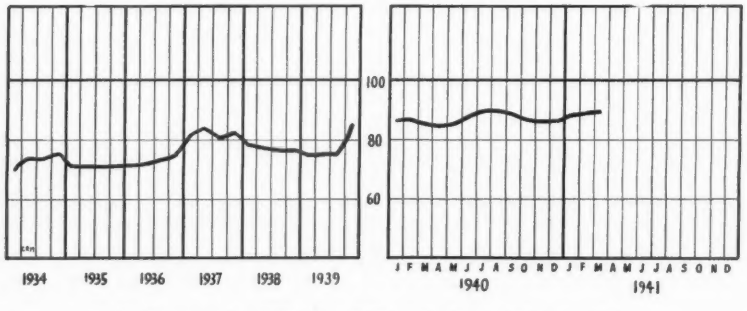
Anise oil 5c
Apricot kernel oil 8c
Arnica flowers $2.50
Balsam Copaiba Para 2c
Balsam Peru 3c
Beeswax white 1½c
Birch tar oil rect. 15c
Buckthorn bark 5c
Cade oil 3c
Caraway oil 75c
Cassia oil, redist. 30c
Celery oil $2.
Chamomile flowers Roman $1.25
Civet $1.
Coriander oil $1.
Cream tartar 5.
Echinacea root 2c
Geranium oil, African 25c
Ipecac root 10c
Lemon grass oil 5c
Lemon peel 5c
Lime oil, exp. $1.
Mace oil, dist. 10c
Menthol Jap. 10c
Chinese 20c
Myrrh gum 3c
Nutmeg oil 10c
Orange oil dom. 25c
W. Ind. $2.50
Peppermint oil nat. 55c
Redist. 55c
Rochelle salt 4c
Sassafras bark 1c
Savin oil $1.50
Seidlitz mixture 3c
Senega root 8c
Spearmint oil 10c
Tartar emetic 3c
Tartaric acid 6c
Thyme oil, red NF 10c
white NF 5c
Valerian root 55c

Down

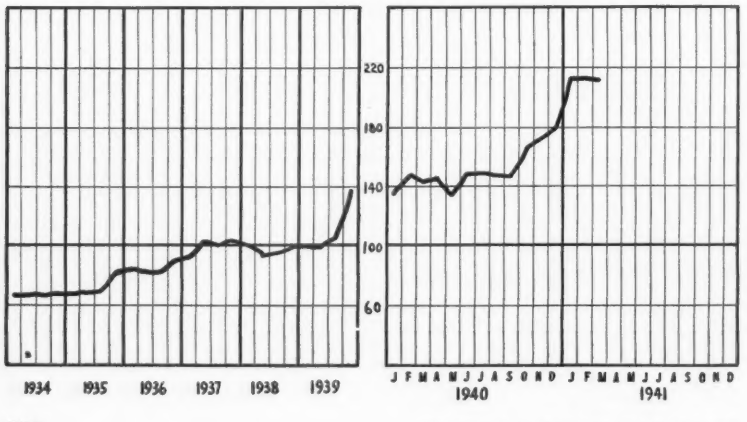
Buchu leaves 9c
Carnauba wax No. 1 4c
Cumin seed Morocco 1c
Gentian root 10c
Golden seal root 15c
Horehound herb 1c
Japan wax 2c
Oleoresin ginger 5c
Patchouli oil 50c
Psyllium seed, black 5c
Saffron Valencia 50c
Wormseed oil 15c

25 Cosmetic Raw Materials—Unweighted Price Index. 1926 = 100.



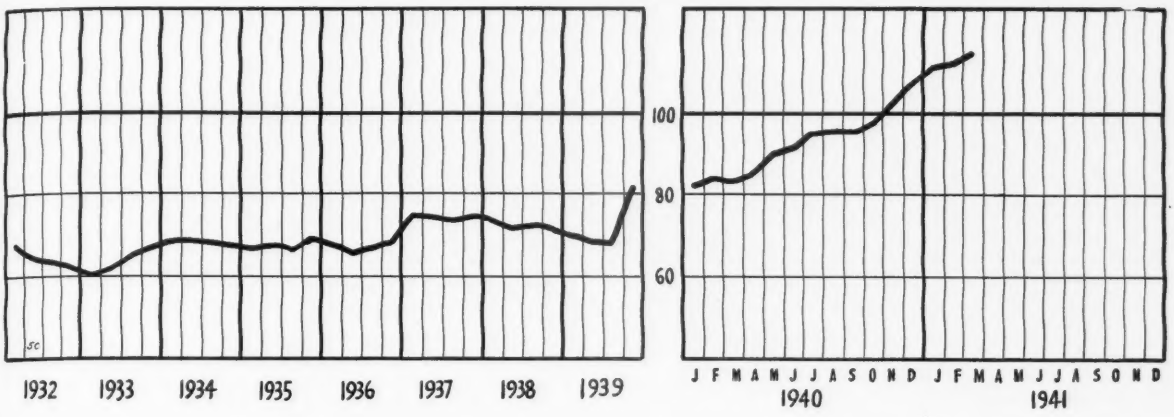
The cosmetic raw materials index advanced fractionally to 89.6 from the previous 89.1. Balsam Copaiba was up 2 cents to 27 cents; Balsam Peru advanced 3 cents to 73 cents; beeswax rose 1½ cents to 38 cents and menthol rose 10 cents to $4. Japan wax was the only item in the group to show a decline. The new schedule was 17 cents from the previous 19 cents.

15 Botanicals—Weighted Price Index. 1926 = 100.



The botanicals index declined slightly from 212.5 to 211.3. Although arnica flowers was up sharply, this was offset by the decline of 9 cents a pound in the spot market price of buchu and the reduction of 10 cents a pound in gentian. Agar and ipecac in this group were also higher at 5 cents and 10 cents respectively. A resumption of strength is generally anticipated as the replacement period is still far ahead.

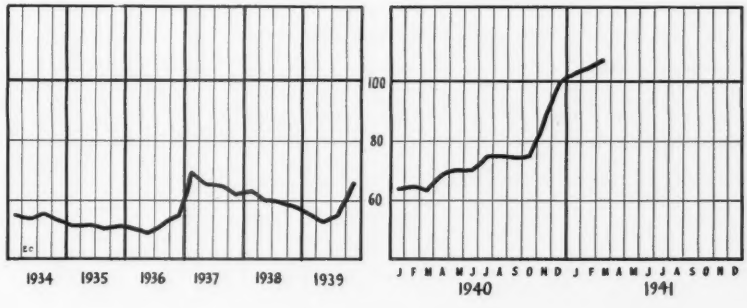
50 Raw Materials—Weighted Price Index. 1926 = 100.



The price index of fifty commodities for March 1941 increased to 114.1 from the previous 112.5. Problems created by blockades and export restrictions continued to be the focal point of all strong points in the market as a whole. More countries and greater areas are now under the influence of these blockades than was the case during the war of 1914-18. Although prices are generally much higher they have not reached anywhere near the high points of the last conflict. This is particularly true of the chemical group. The American chemical industry is now so well developed that this country is independent of many of the raw materials which we depended on so absolutely during the last great war.

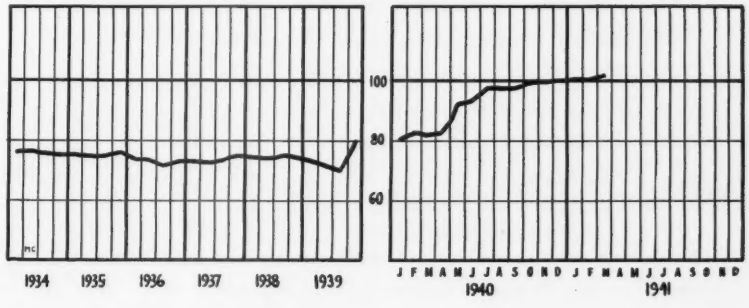
15 Essential Oils—Weighted Price Index. 1926 = 100.

The essential oil index was up to 107.3 from the previous 104.5. Anise oil rose 5 cents to 85 cents; cassia oil was higher at $1.85; lime oil increased $1 to $9; peppermint oil jumped to $3.65 and geranium oil was up 25 cents to $13. The only decline in this group was clove oil now offered at $1.15 from the previous $1.20. Recent developments in the South Pacific continued to have an effect on the price of raw materials from that area.



15 Medicinal Chemicals—Weighted Price Index. 1926 = 100.

Medicinal chemicals index advanced to 101.8 from the previous 100.2. Mercury was very strong at the new price level of $173 a flask; cream of tartar was up 5 cents a pound to 48 cents and Japanese menthol increased 10 cents a pound to $4.10. The tartrates were the feature of the medicinal chemical market during the past month. Crude material continued to be scarce because of the inability of such wine producing countries as Italy and France to make shipments.



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MENTHOL

The winter of 1940-41 proved a particularly favorable one for the domestic consumption of menthol. This fact, together with the conditions prevailing in the leading primary markets, effected the price of menthol to the extent that further advances were noted in all grades during the current trading period.

Japanese natural menthol is now offered on spot at from $4.10 to $4.20 a pound, the Chinese grade is quoted at from $4.00 to $4.05 a pound and synthetic is selling at about $4.00.

One interesting development during the past few months was the way in which Chinese menthol moved steadily upward until it is now nearly on a par with the Japanese product. The shipment market in China is very firm as present stocks are practically exhausted and the new crop will not be available until July-August.

As far as Japan is concerned the market there continues as firm as heretofore. This in spite of the fact that American imports from that market during the current crop year was only about 1,300 cases whereas imports from the Chinese market amounted to approximately 4,300 cases. The total of about 6,000 cases is greater than in the 1939 period but it is said that American consumption of menthol has been increasing during recent years until the above stated figure represents about a normal years consumption here.

According to a report in Foreign Commerce Weekly, imports of natural menthol into the United States during 1940 were about the same in volume and value as in 1939. Because of world conditions, and in the absence of consumption data, it can be assumed that the higher volumes in 1939 and 1940 over 1938 have been due to increased use of menthol and a desire to be protected with sufficient stocks.

Details of imports during recent years follow:

Year	*Quantity (pounds)*	*Value*
1938	365,920	$864,954
1939	406,600	884,000
1940	419,100	847,800

Although menthol has advanced steadily for several months now, importers are of the opinion that at $4.00 a pound prices represent a favorable level. Manufacturing consumers, these factors state, would be well advised to affect some replacements at the present market in view of the many factors which might greatly strengthen the market as a whole.

It is not too certain that China can continue to produce and export menthol without Japanese interference. The situation in the Far East does not encourage the belief that shipping conditions there may not suddenly become precarious. Then again, it is pointed out that manufacturers of synthetic menthol have been ready to advance their prices to correspond very closely to the market for natural material.

These factors should be sufficient inducement to encourage manufacturing consumers to buy menthol sufficient to cover requirements for at least two years ahead.

VANILLA BEANS

A steadily increasing demand for spot vanilla beans led some importers to feel that there will be none too many beans available for distribution to manufacturing consumers by early summer. Business now is mostly in Mexican beans, both whole and cuts. At the present rate at which Mexican cuts have been going into consumption it is likely that by June 1st there will be very few cuts available here.

The supply situation is such that importers are buyers, rather than sellers. Bourbon beans are practically nominal at from $9.50 to $10. a pound. Mexican cuts are very firm at from $8.50 to $8.75 and whole Mexican beans are also in a strong position at the current price range of from $9.50 to $9.75.

Vanilla is a luxury item. That is, it goes into consumption of items which are most likely to feel the direct effect of any large increasing in the spending power of the general public. It is most likely that this purchasing power in the United States will take a sharp upward trend shortly under the influence of rearmament. The result of such a development on the vanilla market under present supply conditions might well be severe.

TARTRATES

The position of crude material still continues to exercise a strong influence on the tartrates as a group. The current trading period experienced another sharp advance in these products. Rochelle salt advanced 4c a pound to 36c in barrels; cream of tartar was up 5c a pound to 48c in barrels; tartaric acid increased 6c a pound to 58c in barrels; tartar emetic was quoted 3c higher at 43c in barrels and seidlitz mixture was also quoted 3c higher at 36c a pound in barrels.

Because of unusual conditions these prices are quoted for prompt shipments only, no contracts being written at the present time.

As there are no indications that domestic sources of crude material will be sufficient to offset the loss of such producing countries as Italy, France and Spain for some time, the market for derivatives will bear close watching.

VITAMIN E

A further reduction in the price of vitamin E was noted during the current trading period with the market now quoted as follows: 1 kilo lots $1.00 per gram; 500 gram lots $1.05 a gram and 100 gram amps. $1.10 per gram. Contracts may be entered at these prices over a 12 month period.

SULFAPYRIDINE

An increase in the consumption of sulfapyridine made it possible to pass along to the consuming trade the consequent reduction in manufacturing costs with the result that a new schedule of prices has been issued as follows: 100 lbs. in 25 lb. tins, $10. a pound; 500 lbs. in 25 lb. tins, $10.10 a pound and 100 lbs. in 25 lb. tins, $10.15 a pound. These same prices apply to sulfapyridine sodium.

ESSENTIAL OILS

Despite disorganization in several of the leading essential oil-producing countries, imports of essential oils into the United States recorded little change in volume but prices were appreciably higher.

Imports of leading essential oils imported into the United States during the past two years are shown in the following table:

	1939	
Item	*Quantity*	*Value*
Cassia and cin...lbs.	443,560	$247,809
Geranium.....do	227,479	472,487
Otto of roses...ozs.	66,551	411,903
Bergamot.....lbs.	211,181	713,085
Citronella and lemon grass.....do	3,274,886	827,156
Lavender.....do	413,423	683,264
Lemon.....do	149,419	312,002
Orange.....do	237,951	192,925
Sandalwood.....do	8,622	29,798
Lime.....do	134,320	404,735
All other.....do	3,534,343	2,148,544
Total value.....		$6,443,708

	1940	
Item	*Quantity*	*Value*
Cassia and cin...lbs.	468,186	$329,752
Geranium.....do	164,301	324,074
Otto of roses....ozs.	39,812	245,256
Bergamot.....lbs.	84,633	399,365
Citronella and lemon grass.....do	3,282,916	895,035
Lavender.....do	231,545	395,469
Lemon.....do	88,031	231,218
Orange.....do	198,748	133,063
Sandalwood.....do	5,449	15,774
Lime.....do	140,668	530,991
All other.....do	4,484,220	2,906,405
Total value.....		$6,406,402

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U.S.S.R.

With American supplies of so many essential oils seriously affected by war, it is always interesting to note reports of the development of new sources. Such a report comes from the Union of Soviet Socialist Republics. In old Russia, essential oil plants were hardly grown at all. But from 1922 on, more and more of these plants have been domesticated and 19 varieties are now cultivated there, including roses, lavender, coriander, geranium, mint, anise, and others.

Most recent additions are lemon sorghum, lemon eucalyptus, patchouli, jasmine, tuberose and Parmesan violet. Beginning with plantings, in scattered plots, of some 5 hectares of mint, there are now 180,000 hectares of plantings, and 24 special factories processing goods to a value of 160,000,000 rubles a year.

The largest plantations are in Gruzia, Tadzhikistan, Armenia, Kirgizia, the Ukraine, and the Crimea; the latest experimental nursery is located near Kishinev. Some 50 State farms and 5,000 collective farms grow essential oil plants regularly. The processing plants control all processes through their own laboratories, and use machinery at all stages. Through experimental stations and its own small pilot plant, a special scientific research institute aids in the development of oil plant culture.

While Soviet Russia has not as yet become a very large exporter of a variety of essential oils, they have increased production of peppermint oil to the extent that shipments to this country have been material. With their success with peppermint oil in mind it is not illogical to assume that other exports will follow, particularly should the war in Europe last through another year.

OILS, FATS, OIL SEEDS

War conditions prevailing in world markets during 1940 were reflected in a number of significant developments in the foreign trade of the United States in fats and oils.

Imports into the American market under this classification during the past calendar year amounted to 1,733,000,000 pounds, 6 per cent. under the total in 1939 and 24 per cent. below the annual average for the 5 year period 1934-38. United States exports of fats and oils in 1940 (including re-exports) totaled 455,000,000 pounds, a decrease of 26 per cent. from shipments in the preceding year.

Imports of castor beans into the United States in 1940 increased by nearly 50 per cent. over the preceding year. India accounted for the bulk of this increase, as receipts from Brazil, the traditional supplier of this item to the American market, remained on about the same level as in 1939. The gain in castor bean imports was due chiefly to expanded use of dehydrated castor oil in the United States paint and varnish industry to supplement inadequate supplies of tung oil.

The elimination of European sources of cod liver oil stimulated United States production of other vitamin fish liver oils, particularly shark liver oil. The sharply curtailed importation of olive oil from Mediterranean countries resulted in increasing the sale of domestic refined vegetable oils and the production of California olive oil.

BOTANICALS

The importance of Central Europe as a producer of botanical drugs is graphically illustrated by the sharp rise in the price of certain crude products originating almost exclusively in Hungary.

Kind	*Aug. '39 Price*	*Mar. '40 Price*
Ergot	$1.50	$1.55
Henbane leaves	.16	1.75
Elder flowers	.21	.72
Stramonium leaves	.12	.48
Chamomile flowers	.20	1.50
Dandelion root	.14	.80

While a wide variety of botanicals are grown in Hungary, chamomile and stramonium have been the most important. Official figures of production are not available, but it was estimated at 4,238 metric tons during the year ended March 31, 1940, of which 1,660 tons were produced on cultivated land and 2,578 tons grew wild. Production during the preceding year was estimated at 2,574 tons, of which 620 were grown on cultivated land, and 1,954 wild.

Increased production in 1939-1940 resulted chiefly from a larger output of peppermint leaves, production of which rose from 579 metric tons during the 1938-1939 season to 1,560 metric tons in 1939-1940, and was due, it is stated, to demand from Germany where peppermint leaves are being used as a substitute for tea.

The following data shows the principal kinds of medicinal roots, herbs, and flowers exported from Hungary during the year ended March 31, 1940:

Kind	*Metric tons*
Ergot	40
Henbane leaves	37
Elder flowers	110
Juniper berries	187
Peppermint leaves	1,561
Nettle leaves	208
Hip fruit	315
Stramonium leaves	222
Chamomile flowers	558
Dandelion root	22
Althea root	67
Linden flowers	26
Horsetail	101
Miscellaneous roots, herbs, and flowers	635

Exports to the United States have consisted mainly of belladonna, stramonium, and henbane leaves, with lesser quantities of coriander seeds, juniper berries, althea, alkanet and dandelion roots and elder and linden flowers and herbs.

According to official United States statistics a total of $75,000 worth of crude drug botanicals was imported into the United States from Hungary during the calendar year 1939. During the first 11 months of 1940, the total amounted to $63,000. Hungary has been the principal source for United States imports of chamomile and stramonium for several years; limited quantities of belladonna, ergot and a few other crude drugs have also originated in that country.

Of outstanding interest in 1940 was the importation of 15,700 pounds of ergot, valued at $34,700. Other imports of Hungarian botanicals into the United States in the 11 months of 1940 were: belladonna, 33,300 pounds, chamomile 33,600 pounds and stramonium 156,200 pounds.

ORANGE OIL

California orange oil cold pressed advanced 25c a pound during the current trading period and is now offered at $2.25 per pound in 25 lb. cans.

MERCURY

The mercury market showed considerable strength during the past month because of the small quantities available on spot. The price generally asked during late trading was $173. a flask.

CASSIA OIL

Most raw materials originating in the Far East were exceptionally firm during the current trading period. Cassia oil lead what advances there were to be quoted at the new high level price of from $1.85 to $1.90 a pound. Anise oil also advanced further during the past month, now being quoted at from 85c to 95c a pound. Agar agar from Japan was also up 5c a pound to be quoted at the new price range of from $1.45 to $1.50. Menthol also advanced in line with the trend of those items which will most directly feel the brunt of further disruption of shipping in the South Pacific.

NICOTINIC ACID

The increasing importance, and the constantly growing consuming market for nicotinic acid, has made it possible for manufacturers to announce a further price reduction. In 25 pound metal drums the price is now $7.30 a pound. In 1,000 pound lots the price is $7.00. A 5 pound metal drum is quoted at $7.46 a pound. Contracts are being entered over a 12 month period at the present market.

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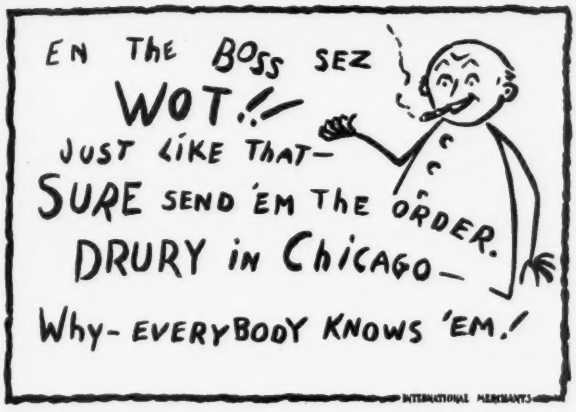

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